*Final*

# Volume 3: JN-2, Critical Assembly Building

# Battelle Columbus Laboratories Decommissioning Project

## Baseline, Revision 3

June 28, 2002

**Volume 3—JN-2, Critical Assembly Building**

A. Outline of Volume
B. Approach
C. Cost by Year (separate volume)
D. Schedule
E. Logic Networks
F. Pricing Sheets (separate volume)
   & Data Templates

# BCLDP Baseline: Activity ID / Work Package Matrix

| Open Plan ID | Work Package Number | Description |
|---|---|---|
| **Building JN-2** | | |
| D006 | 7D2-B01 | Survey & Monitor 2nd Floor |
| D006P | 7D2-B01 | PLAN: Survey & Monitor 2nd Floor |
| D020 | 7D2-B02 | Survey & Monitor 1st Floor |
| D063 | 7D2-B03 | Survey & Monitor External Building Surfaces (including Roof) |
| D067 | 7D2-B04 | Prepare JN-2 Characterization and Final Status Report |
| D074 | 7D2-B05 | Survey & Monitor Underground |
| D074P | 7D2-B05 | PLAN: Survey & Monitor Underground |
| D002 | 7D4-B01 | Remove 2nd Floor Material |
| D002P | 7D4-B01 | PLAN: Remove 2nd Floor Material |
| D003 | 7D4-B02 | Remove 2nd Floor Utilities, Hoods, Ducts and Piping |
| D003P | 7D4-B02 | PLAN: Remove 2nd Floor Utilities, Hoods, Ducts and Piping |
| D004 | 7D4-B02 | Remove 1st and 2nd Floor Asbestos Material |
| D004P | 7D4-B02 | PLAN: Remove 1st and 2nd Floor Asbestos Material |
| D012 | 7D4-B03 | Decontaminate 2nd Floor Surfaces |
| D012P | 7D4-B03 | PLAN: Decontaminate 2nd Floor Surfaces |
| D014 | 7D4-B04 | Perform 2nd Floor Decon Completion Survey |
| D016 | 7D4-B06 | Remove 1st Floor Material |
| D016P | 7D4-B06 | PLAN: Remove 1st Floor Material |
| D017 | 7D4-B07 | Remove 1st Floor Utilities, Hoods, Ducts and Piping |
| D017P | 7D4-B07 | PLAN: Remove 1st Floor Utilities, Hoods, Ducts and Piping |
| D031 | 7D4-B07 | Remove 1st Floor Boiler and Utilities |
| D031P | 7D4-B07 | PLAN: Remove 1st Floor Boiler and Utilities |
| D026 | 7D4-B08 | Decontaminate 1st Floor Surfaces |
| D026P | 7D4-B08 | PLAN: Decontaminate 1st Floor Surfaces |
| D027 | 7D4-B08 | Remove Underground Drains |
| D027P | 7D4-B08 | PLAN: Remove Underground Drains |
| D028 | 7D4-B09 | Perform 1st Floor Decon Completion Survey |
| D061 | 7D4-B10 | Remove Mechanical & Electrical Equipment from External Building Surfaces |
| D061P | 7D4-B10 | PLAN: Remove Mechanical & Electrical Equipment from External Building Surfaces |
| D069 | 7D4-B11 | Decontaminate External Building Surfaces |
| D069P | 7D4-B11 | PLAN: Decontaminate External Building Surfaces |
| D070 | 7D4-B12 | Perform External Building Surface Decon Completion Survey |
| D071 | 7D4-B13 | Remove NESHAPS Material |
| D071P | 7D4-B13 | PLAN: Remove NESHAPS Material |
| D072 | 7D4-B14 | Demolish Surface Structure |
| D072P | 7D4-B14 | PLAN: Demolish Surface Structure |
| D080 | 7D4-B15 | Excavate Underground |
| D080P | 7D4-B15 | PLAN: Excavate Underground |
| D075 | 7D4-B16 | Perform JN-2 Underground Remediation Completion Survey |
| D081 | 7D4-B17 | JN-2 Final Status Surveys before Demolition |
| DS010 | 7D5-B01 | Prepare JN-2 Areas Characterization and Final Status Report |
| DS011 | 7D5-B01 | Conduct JN-2 Areas IVC |
| DS011P | 7D5-B01 | PLAN: Conduct JN-2 Areas IVC |
| D082 | 7D5-B02 | JN-2 IVC before Demolition |
| D082P | 7D5-B02 | PLAN: JN-2 IVC before Demolition |

# BCLDP Baseline, Revision 3

## Approach

*History – Building JN-2, Critical Assembly Building*

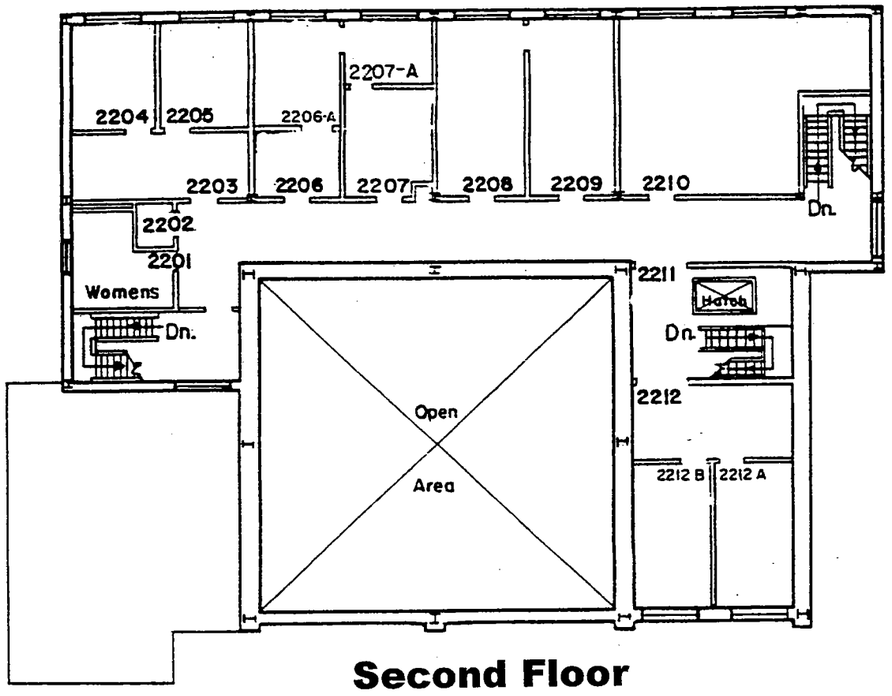
Formerly known as the Critical Assembly Laboratory (CAL), the building was originally used for criticality experiments from 1957 through 1963. Since the cessation of criticality experiments, the building has been used for several nuclear-related projects, including direct conversion concepts, irradiation experiment assembly, and special nuclear materials storage and dispensing. A small plutonium laboratory (decommissioned in the 1970s) was located in the area currently occupied by a radioanalytical laboratory (RAL). The radiation instrument service facility is also housed within the building. Over time, uranium, plutonium, activation products, and fission products in various forms were present and/or used in the building. Currently, only trace levels of radioactive materials are present in the RAL. The instrument service facility contains various calibration sources, including Co-60, Cs-137, and Pu-Be in storage for subsequent waste managing. A wastewater storage tank is located outside the north side of the building. It is estimated that the tank has been used to store radioanalytical lab wastewater for over 20 years.

*Planned Approach for D&D of Building JN-2*

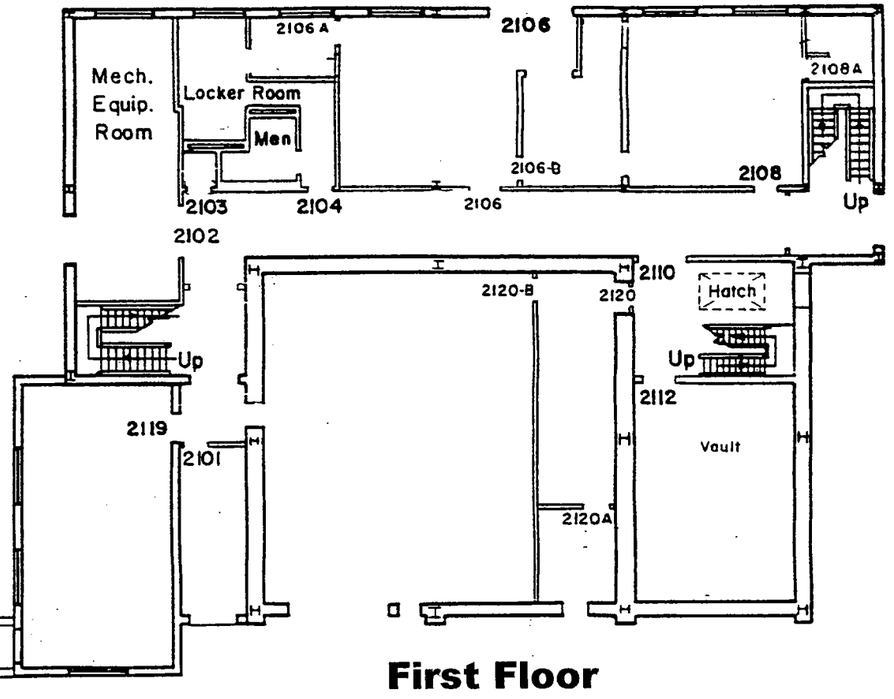
The Radioanalytical and Environmental Monitoring Laboratories currently occupy building JN-2. Radiological surveys performed to date have indicated that, outside the RAL, there is very little contamination in Building JN-2. The overall strategy for D&D of Building JN-2 therefore involves relocation of building occupants to alternate facilities and removal of materials and utilities from both internal and external building surfaces followed by characterization, surface decontamination to less than regulatory limits, buried drain line removal, and, finally, demotion of the building and its foundation according to standard industrial practice. Radiological oversight will be provided for the duration of these activities to ensure worker safety and to assure that no contaminated materials are improperly disposed of.

The above sequence of activities is expected to be followed within all building area. Interior material/utility removal and characterization may be carried out either concurrently or sequentially on the second and first floors depending on resources and schedule requirements. Decontamination and completion surveys will begin on the second floor and proceed to the first floor and boiler room followed by underground drain removal. Characterization, decontamination, and completion surveys of the building exterior will not be performed until the interior work is complete in order to avoid any potential cross contamination due to emissions. The window units, which contain asbestos in the glazing, will then be removed and the building surface structure will be demolished and removed according to industrial standards. Surveys of the underlying soils will be conducted and any found to be contaminated will be removed for disposal as

LLW prior to removal of foundations and footers. Resulting excavations will remain open pending IVC confirmation that no contamination above regulatory limits remains.




Second Floor




First Floor

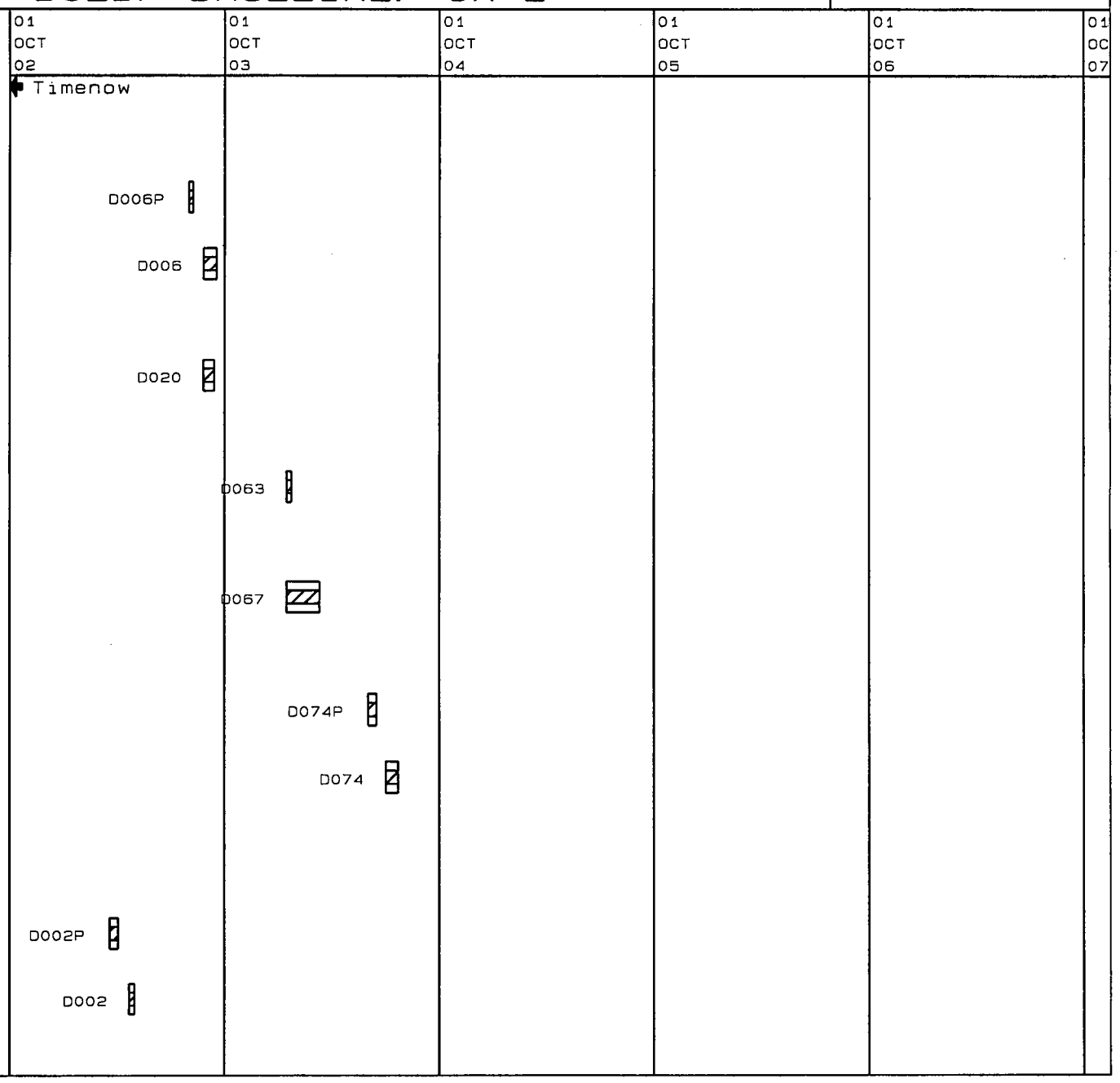
# Building JN-2

OPEN PLAN - PDM
Report: ZBAR
Project: BASELINE
Timenow: 01OCT02
Date: 27JUN02
Page: 1

# Battelle
# BCLDP BASELINE: JN-2

BAR LEGEND
Actuals
Forecast
Baseline

| WORKPKG | BCOST | PCT | DU | RDU | BSTART | BFINISH | ESDATE | EFDATE |
|---|---|---|---|---|---|---|---|---|
| **1.7.D.2. JN-2 CHARACTERIZATION** | | | | | | | | |
| **7D2-B01 : SURVEY AND MONITOR JN-2 2ND FLOOR** | | | | | | | | |
| D006P PLAN: Survey & Monitor 2nd Floor | | | | | | | | 1 |
| 7D2-B01 | $ 8061 | 5 | 5 | | 01AUG03 | 07AUG03 | 01AUG03 | 07AUG03 |
| D006 Survey & Monitor 2nd Floor | | | | | | | | 1 |
| 7D2-B01 | $ 38473 | 15 | 15 | | 26AUG03 | 16SEP03 | 26AUG03 | 16SEP03 |
| **7D2-B02 : SURVEY AND MONITOR JN-2 1ST FLOOR** | | | | | | | | |
| D020 Survey & Monitor 1st Floor | | | | | | | | 1 |
| 7D2-B02 | $ 40641 | 13 | 13 | | 26AUG03 | 12SEP03 | 26AUG03 | 12SEP03 |
| **7D2-B03 : SURVEY AND MONITOR JN-2 BUILDING EXTERNAL SURFACES** | | | | | | | | |
| D063 Survey & Monitor External Building Surfaces (including Roof) | | | | | | | | 1 |
| 7D2-B03 | $ 19095 | 6 | 6 | | 15JAN04 | 22JAN04 | 15JAN04 | 22JAN04 |
| **7D2-B04 : PREPARE JN-2 CHARACTERIZATION REPORT** | | | | | | | | |
| D067 Prepare JN-2 Characterization and Final Status Report | | | | | | | | 1 |
| 7D2-B04 | $ 20350 | 40 | 40 | | 15JAN04 | 10MAR04 | 15JAN04 | 10MAR04 |
| **7D2-B05 : SURVEY AND MONITOR JN-2 UNDERGROUND MATERIAL** | | | | | | | | |
| D074P PLAN: Survey & Monitor Underground | | | | | | | | 1 |
| 7D2-B05 | $ 19229 | 10 | 10 | | 02JUN04 | 15JUN04 | 02JUN04 | 15JUN04 |
| D074 Survey & Monitor Underground | | | | | | | | 1 |
| 7D2-B05 | $ 39031 | 14 | 14 | | 02JUL04 | 22JUL04 | 02JUL04 | 22JUL04 |
| **1.7.D.4. JN-2 DECONTAMINATION OPERATION** | | | | | | | | |
| **7D4-B01 : 2ND FLOOR MATERIAL REMOVAL** | | | | | | | | |
| D002P PLAN: Remove 2nd Floor Material | | | | | | | | 1 |
| 7D4-B01 | $ 6269 | 10 | 10 | | 20MAR03 | 02APR03 | 20MAR03 | 02APR03 |
| D002 Remove 2nd Floor Material | | | | | | | | 1 |
| 7D4-B01 | $ 33712 | 7 | 7 | | 22APR03 | 30APR03 | 22APR03 | 30APR03 |
| **7D4-B02 : 2ND FLOOR UTILITY/ASBESTOS REMOVAL** | | | | | | | | |

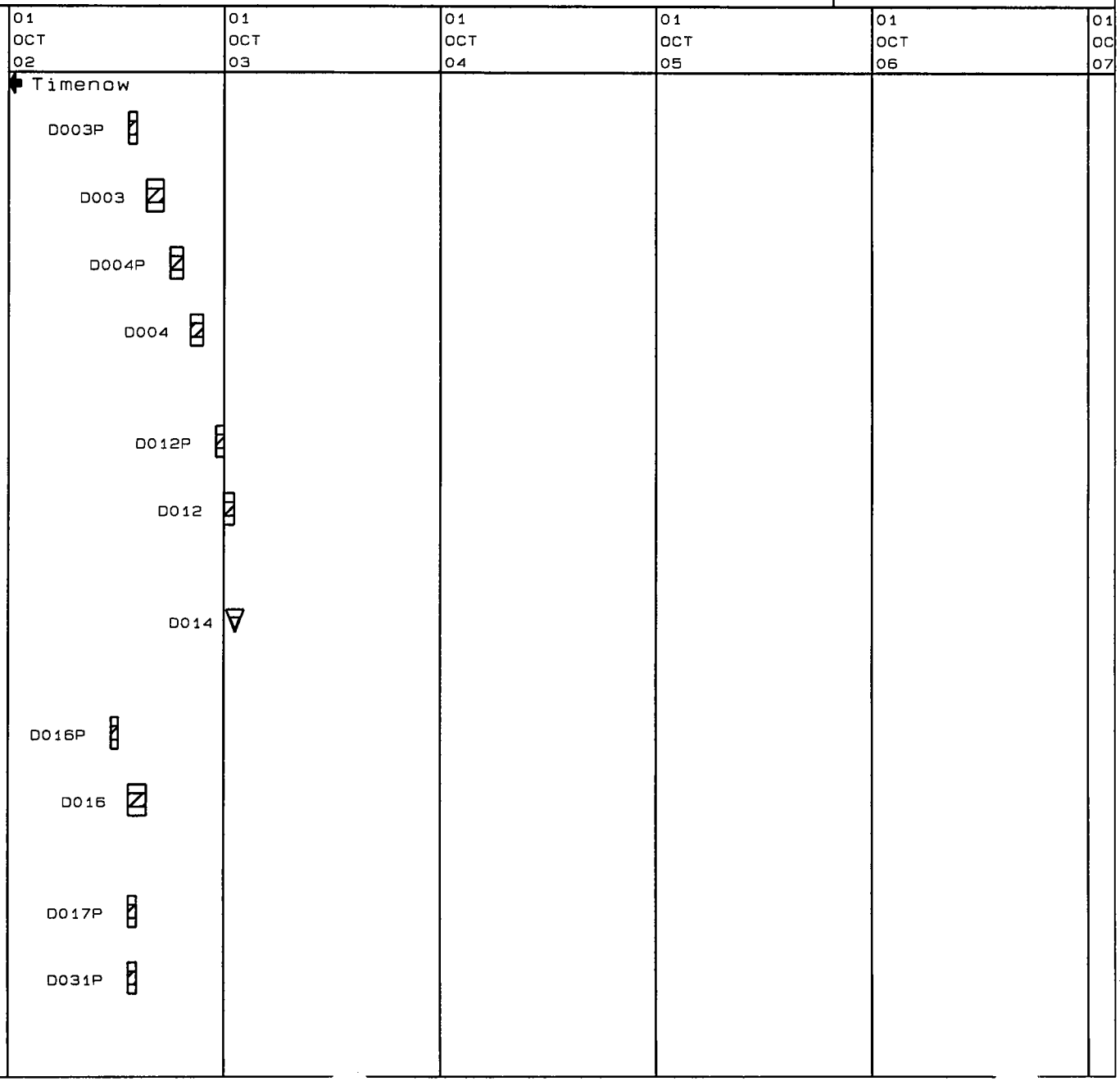


OPEN PLAN - PDM
Report: ZBAR
Project: BASELINE
Timenow: 01OCT02
Date: 27JUN02
Page: 2

# Battelle
# BCLDP BASELINE: JN-2

BAR LEGEND
Actuals
Forecast
Baseline

| WORKPKG | BCOST | PCT | DU | ROU | BSTART | BFINISH | ESDATE | EFDATE |
|---|---|---|---|---|---|---|---|---|
| D003P PLAN: Remove 2nd Floor Utilities, Hoods, Ducts and Piping | | | | | | | | 1 |
| 7D4-B02 | $ 8174 | | 10 | 10 | 22APR03 | 05MAY03 | 22APR03 | 05MAY03 |
| D003 Remove 2nd Floor Utilities, Hoods, Ducts and Piping | | | | | | | | 1 |
| 7D4-B02 | $ 56576 | | 20 | 20 | 22MAY03 | 19JUN03 | 22MAY03 | 19JUN03 |
| D004P PLAN: Remove 1st and 2nd Floor Asbestos Material | | | | | | | | 1 |
| 7D4-B02 | $ 6734 | | 15 | 15 | 01JUL03 | 22JUL03 | 01JUL03 | 22JUL03 |
| D004 Remove 1st and 2nd Floor Asbestos Material | | | | | | | | 1 |
| 7D4-B02 | $ 51035 | | 15 | 15 | 05AUG03 | 25AUG03 | 05AUG03 | 25AUG03 |
| 7D4-B03 : DECON 2ND FLOOR SURFACES | | | | | | | | |
| D012P PLAN: Decontaminate 2nd Floor Surfaces | | | | | | | | 1 |
| 7D4-B03 | $ 4525 | | 10 | 10 | 17SEP03 | 30SEP03 | 17SEP03 | 30SEP03 |
| D012 Decontaminate 2nd Floor Surfaces | | | | | | | | 1 |
| 7D4-B03 | $ 49489 | | 13 | 13 | 01OCT03 | 17OCT03 | 01OCT03 | 17OCT03 |
| 7D4-B04 : PERFORM 2ND FLOOR COMPLETION SURVEY | | | | | | | | |
| D014 Perform 2nd Floor Decon Completion Survey | | | | | | | | 1 |
| 7D4-B04 | $ 2815 | | 1 | 1 | 20OCT03 | 20OCT03 | 20OCT03 | 20OCT03 |
| 7D4-B06 : 1ST FLOOR MATERIAL REMOVAL | | | | | | | | |
| D016P PLAN: Remove 1st Floor Material | | | | | | | | 1 |
| 7D4-B06 | $ 6269 | | 10 | 10 | 24MAR03 | 04APR03 | 24MAR03 | 04APR03 |
| D016 Remove 1st Floor Material | | | | | | | | 1 |
| 7D4-B06 | $ 81917 | | 22 | 22 | 22APR03 | 21MAY03 | 22APR03 | 21MAY03 |
| 7D4-B07 : 1ST FLOOR BOILER AND UTILITIES REMOVAL | | | | | | | | |
| D017P PLAN: Remove 1st Floor Utilities, Hoods, Ducts and Piping | | | | | | | | 1 |
| 7D4-B07 | $ 8842 | | 10 | 10 | 22APR03 | 05MAY03 | 22APR03 | 05MAY03 |
| D031P PLAN: Remove 1st Floor Boiler and Utilities | | | | | | | | 1 |
| 7D4-B07 | $ 9707 | | 10 | 10 | 22APR03 | 05MAY03 | 22APR03 | 05MAY03 |

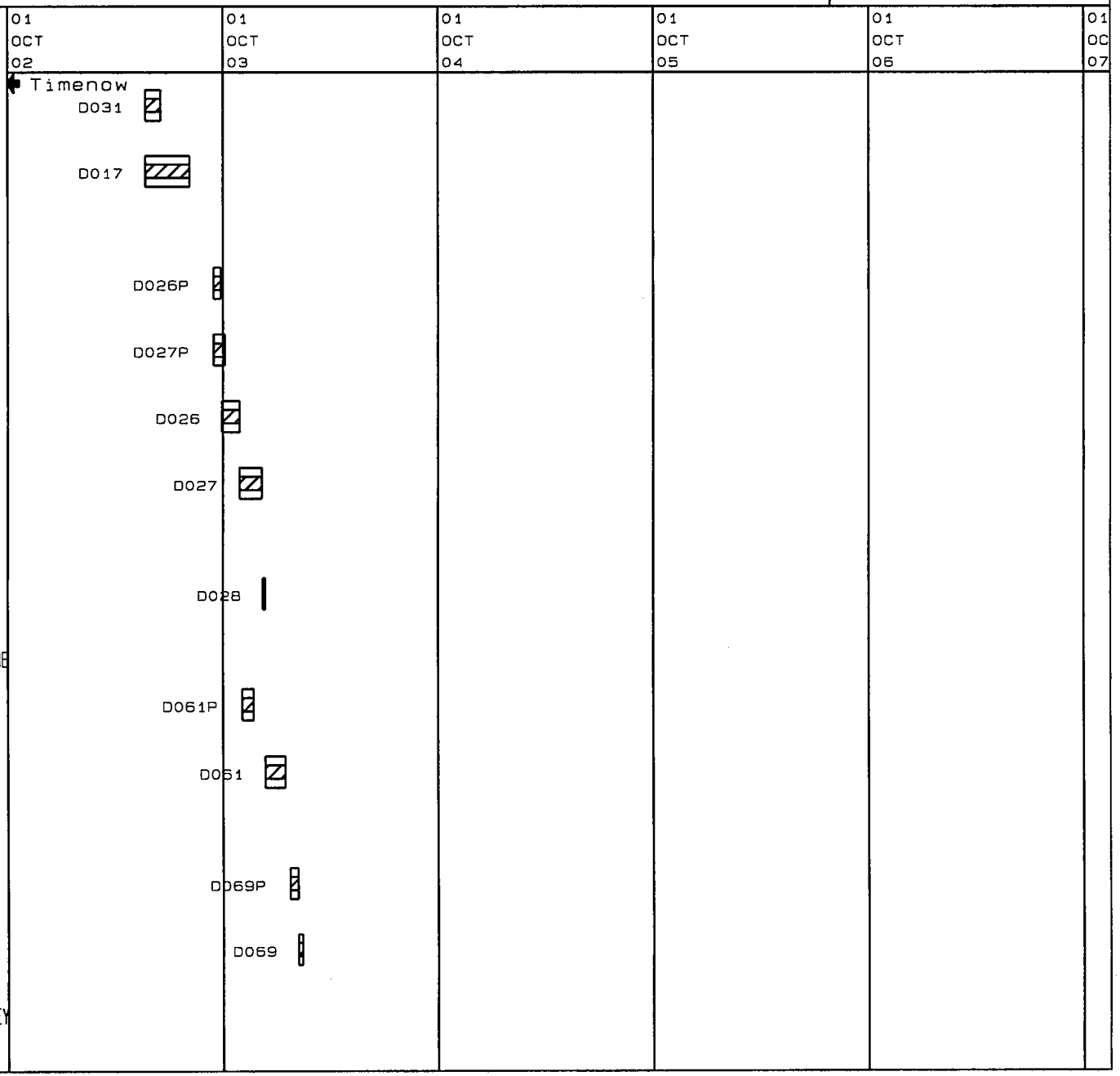


OPEN PLAN - PDM
Report: ZBAR
Project: BASELINE
Timenow: 01OCT02
Date: 27JUN02
Page: 3

# Battelle
# BCLDP BASELINE: JN-2

BAR LEGEND
Actuals
Forecast
Baseline

| WORKPKG | | BCOST | PCT | DU | RDU | BSTART | BFINISH | ESDATE | EFDATE | |
|---|---|---|---|---|---|---|---|---|---|---|
| D031 | Remove 1st Floor Boiler and Utilities | | | | | | | | | 1 |
| 7D4-B07 | | $ 56168 | | 17 | 17 | 22MAY03 | 16JUN03 | 22MAY03 | 16JUN03 | |
| D017 | Remove 1st Floor Utilities, Hoods, Ducts and Piping | | | | | | | | | 1 |
| 7D4-B07 | | $ 175252 | | 51 | 51 | 22MAY03 | 04AUG03 | 22MAY03 | 04AUG03 | |
| 7D4-B08 : DECON 1ST FLOOR SURFACES/UNDERGROUND DRAIN REMOVAL | | | | | | | | | | |
| D026P | PLAN: Decontaminate 1st Floor Surfaces | | | | | | | | | 1 |
| 7D4-B08 | | $ 4525 | | 10 | 10 | 15SEP03 | 26SEP03 | 15SEP03 | 26SEP03 | |
| D027P | PLAN: Remove Underground Drains | | | | | | | | | 1 |
| 7D4-B08 | | $ 9683 | | 15 | 15 | 15SEP03 | 03OCT03 | 15SEP03 | 03OCT03 | |
| D026 | Decontaminate 1st Floor Surfaces | | | | | | | | | 1 |
| 7D4-B08 | | $ 84696 | | 22 | 22 | 29SEP03 | 28OCT03 | 29SEP03 | 28OCT03 | |
| D027 | Remove Underground Drains | | | | | | | | | 1 |
| 7D4-B08 | | $ 128185 | | 26 | 26 | 29OCT03 | 05DEC03 | 29OCT03 | 05DEC03 | |
| 7D4-B09 : PERFORM 1ST FLOOR COMPLETION SURVEY | | | | | | | | | | |
| D028 | Perform 1st Floor Decon Completion Survey | | | | | | | | | 1 |
| 7D4-B09 | | $ 12648 | | 4 | 4 | 08DEC03 | 11DEC03 | 08DEC03 | 11DEC03 | |
| 7D4-B10 : EXTERNAL SURFACES MECHANICAL/ELECTRICAL EQUIPMENT RE | | | | | | | | | | |
| D061P | PLAN: Remove Mechanical & Electrical Equipment from External Build | | | | | | | | | 1 |
| 7D4-B10 | | $ 6269 | | 15 | 15 | 03NOV03 | 21NOV03 | 03NOV03 | 21NOV03 | |
| D061 | Remove Mechanical & Electrical Equipment from External Building Su | | | | | | | | | 1 |
| 7D4-B10 | | $ 62214 | | 20 | 20 | 12DEC03 | 14JAN04 | 12DEC03 | 14JAN04 | |
| 7D4-B11 : DECON EXTERNAL BUILDING SURFACES | | | | | | | | | | |
| D069P | PLAN: Decontaminate External Building Surfaces | | | | | | | | | 1 |
| 7D4-B11 | | $ 4525 | | 10 | 10 | 23JAN04 | 05FEB04 | 23JAN04 | 05FEB04 | |
| D069 | Decontaminate External Building Surfaces | | | | | | | | | 1 |
| 7D4-B11 | | $ 17829 | | 5 | 5 | 06FEB04 | 12FEB04 | 06FEB04 | 12FEB04 | |
| 7D4-B12 : PERFORM EXTERNAL BUILDING SURFACES COMPLETION SURVEY | | | | | | | | | | |

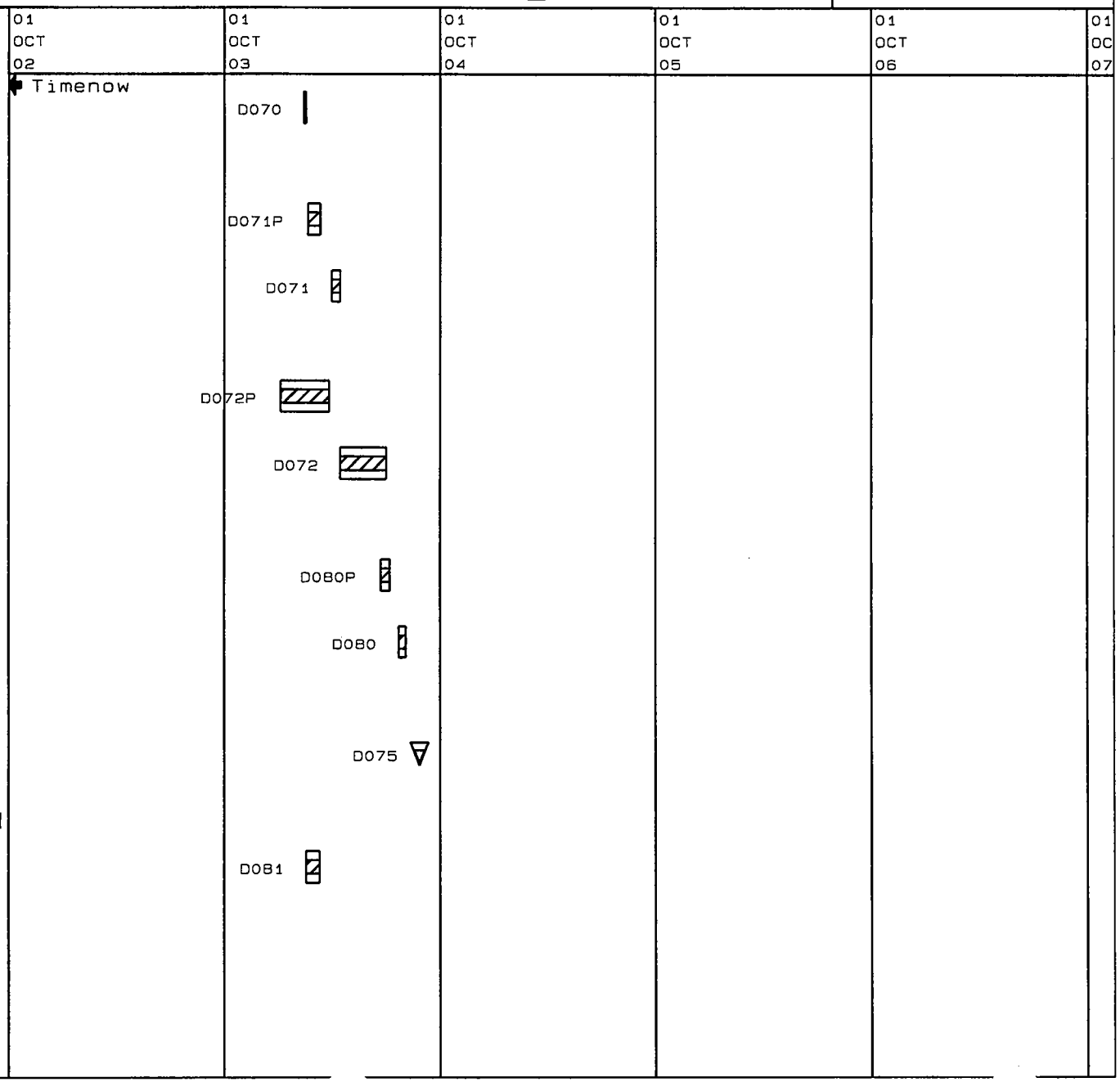


OPEN PLAN - PDM
Report: ZBAR
Project: BASELINE
Timenow: 01OCT02
Date: 27JUN02
Page: 4

# Battelle
# BCLDP BASELINE: JN-2

BAR LEGEND
Actuals
Forecast
Baseline

| WORKPKG | BCOST | PCT | DU | RDU | BSTART | BFINISH | ESDATE | EFDATE |
|---|---|---|---|---|---|---|---|---|
| D070 Perform External Building Surface Decon Completion Survey | | | | | | | | 1 |
| 7D4-B12 | $ 6475 | | 2 | 2 | 13FEB04 | 16FEB04 | 13FEB04 | 16FEB04 |
| 7D4-B13 : REMOVE NESHAPS MATERIAL | | | | | | | | |
| D071P PLAN: Remove NESHAPS Material | | | | | | | | 1 |
| 7D4-B13 | $ 6635 | | 15 | 15 | 20FEB04 | 11MAR04 | 20FEB04 | 11MAR04 |
| D071 Remove NESHAPS Material | | | | | | | | 1 |
| 7D4-B13 | $ 20557 | | 10 | 10 | 01APR04 | 14APR04 | 01APR04 | 14APR04 |
| 7D4-B14 : DEMOLISH JN-2 STRUCTURE | | | | | | | | |
| D072P PLAN: Demolish Surface Structure | | | | | | | | 1 |
| 7D4-B14 | $ 13314 | | 60 | 60 | 05JAN04 | 26MAR04 | 05JAN04 | 26MAR04 |
| D072 Demolish Surface Structure | | | | | | | | 1 |
| 7D4-B14 | $ 215082 | | 55 | 55 | 15APR04 | 01JUL04 | 15APR04 | 01JUL04 |
| 7D4-B15 : EXCAVATE JN-2 UNDERGROUND MATERIAL | | | | | | | | |
| D080P PLAN: Excavate Underground | | | | | | | | 1 |
| 7D4-B15 | $ 8842 | | 10 | 10 | 23JUN04 | 07JUL04 | 23JUN04 | 07JUL04 |
| D080 Excavate Underground | | | | | | | | 1 |
| 7D4-B15 | $ 22854 | | 8 | 8 | 23JUL04 | 03AUG04 | 23JUL04 | 03AUG04 |
| 7D4-B16 : PERFORM JN-2 UNDERGROUND COMPLETION SURVEY | | | | | | | | |
| D075 Perform JN-2 Underground Remediation Completion Survey | | | | | | | | 1 |
| 7D4-B16 | $ 2815 | | 1 | 1 | 27AUG04 | 27AUG04 | 27AUG04 | 27AUG04 |
| 7D4-B17 : PERFORM JN-2 FINAL STATUS SURVEYS BEFORE DEMOLITION | | | | | | | | |
| D081 JN-2 Final Status Surveys before Demolition | | | | | | | | 1 |
| 7D4-B17 | $ 52344 | | 17 | 17 | 17FEB04 | 10MAR04 | 17FEB04 | 10MAR04 |
| 1.7.D.5. JN-2 CERTIFICATION AND RELEASE | | | | | | | | |
| 7D5-B01 : PREPARE JN-2 FINAL STATUS REPORT AND IVC | | | | | | | | |

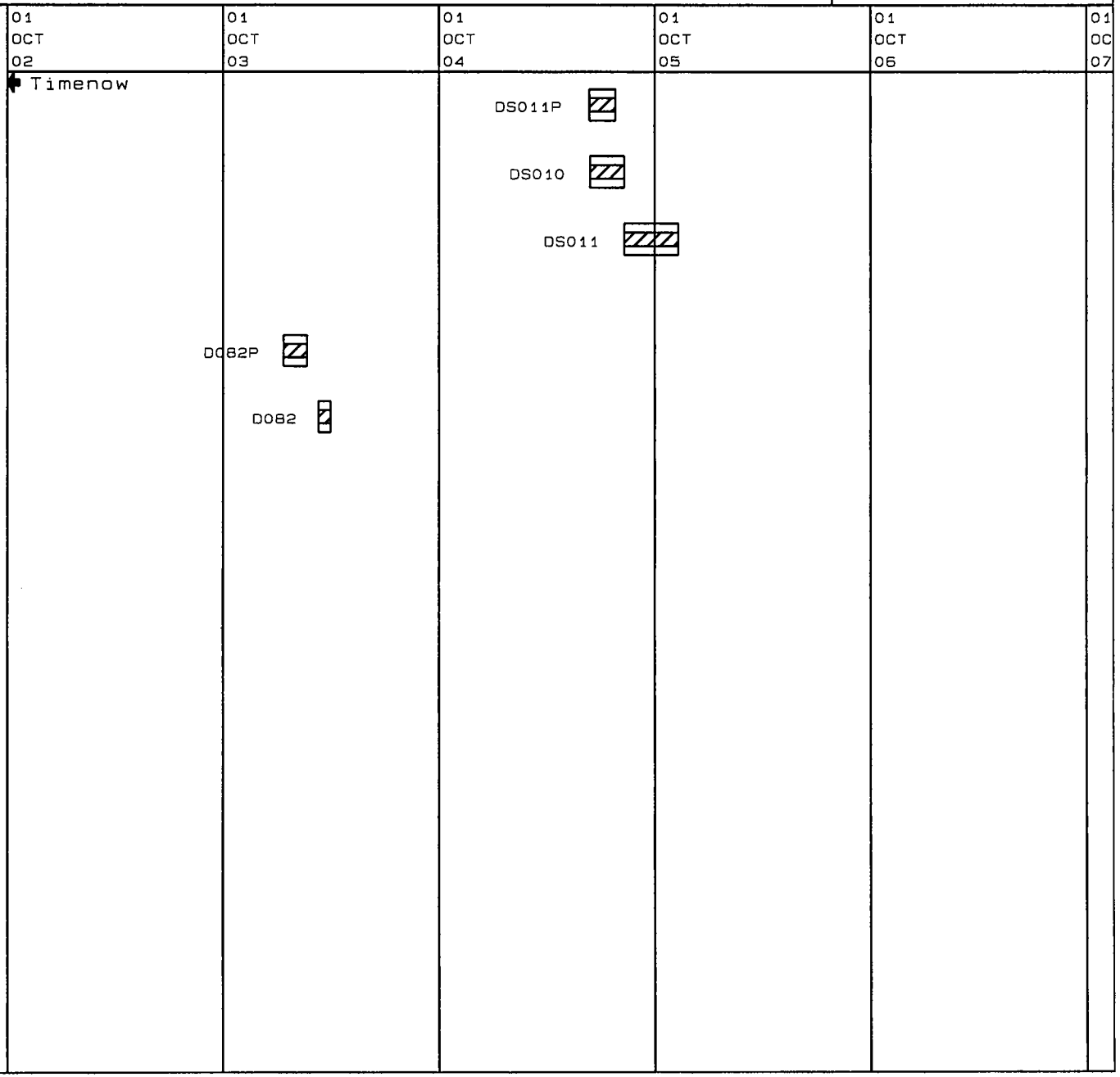


OPEN PLAN - PDM
Report: ZBAR
Project: BASELINE
Timenow: 01OCT02
Date: 27JUN02
Page: 5

# Battelle
# BCLDP BASELINE: JN-2

BAR LEGEND
Actuals
Forecast
Baseline

| WORKPKG | BCOST | PCT | DU | RDU | BSTART | BFINISH | ESDATE | EFDATE | |
|---|---|---|---|---|---|---|---|---|---|
| DS011P PLAN: Conduct JN-2 Areas IVC | | | | | | | | | 1 |
| 7D5-B01 | $ 3194 | | 30 | 30 | 13JUN05 | 26JUL05 | 13JUN05 | 26JUL05 | |
| DS010 Prepare JN-2 Areas Characterization and Final Status Report | | | | | | | | | 1 |
| 7D5-B01 | $ 52703 | | 40 | 40 | 14JUN05 | 10AUG05 | 14JUN05 | 10AUG05 | |
| DS011 Conduct JN-2 Areas IVC | | | | | | | | | 1 |
| 7D5-B01 | $ 46825 | | 64 | 64 | 11AUG05 | 09NOV05 | 11AUG05 | 09NOV05 | |
| 7D5-B02 : CONDUCT JN-2 IVC BEFORE DEMOLITION | | | | | | | | | |
| D082P PLAN: JN-2 IVC before Demolition | | | | | | | | | 1 |
| 7D5-B02 | $ 3194 | | 30 | 30 | 12JAN04 | 20FEB04 | 12JAN04 | 20FEB04 | |
| D082 JN-2 IVC before Demolition | | | | | | | | | 1 |
| 7D5-B02 | $ 66365 | | 15 | 15 | 11MAR04 | 31MAR04 | 11MAR04 | 31MAR04 | |



A1

# BCLDP BASELINE LOGIC: Building JN-2

06/27/02
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Page 1

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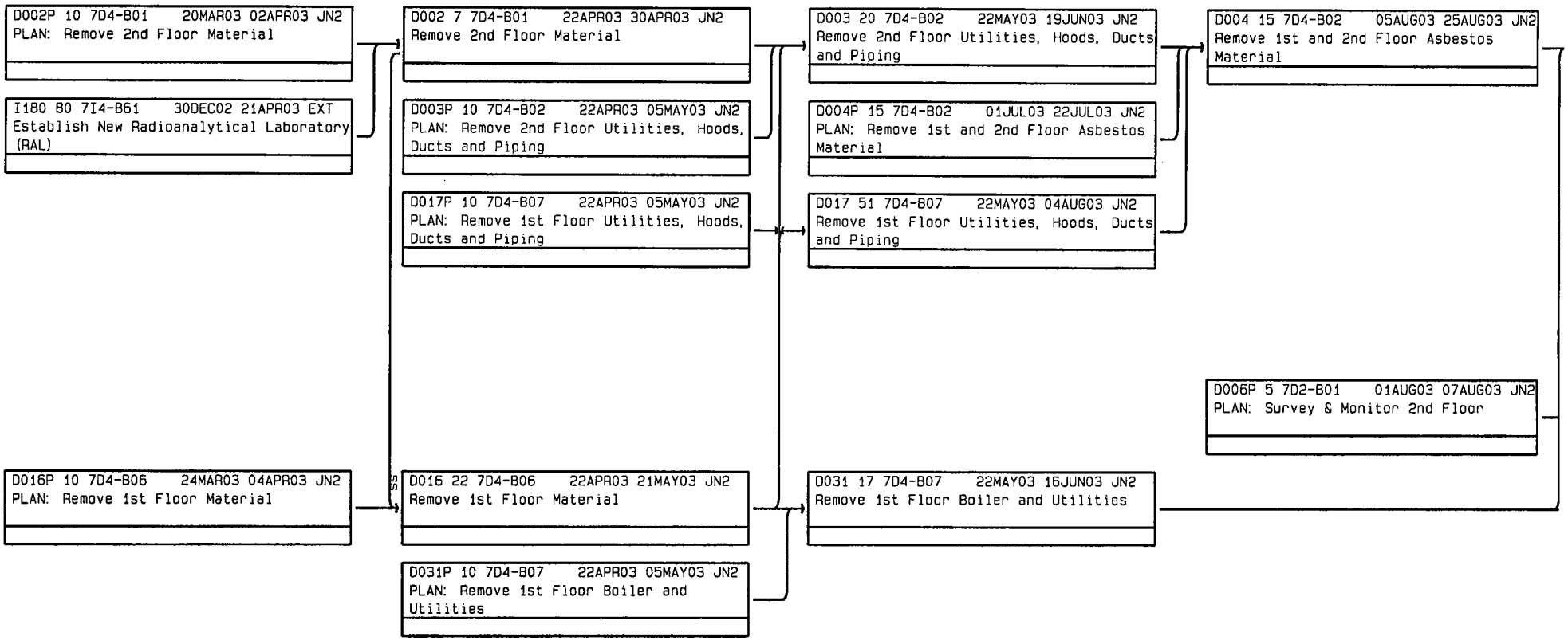
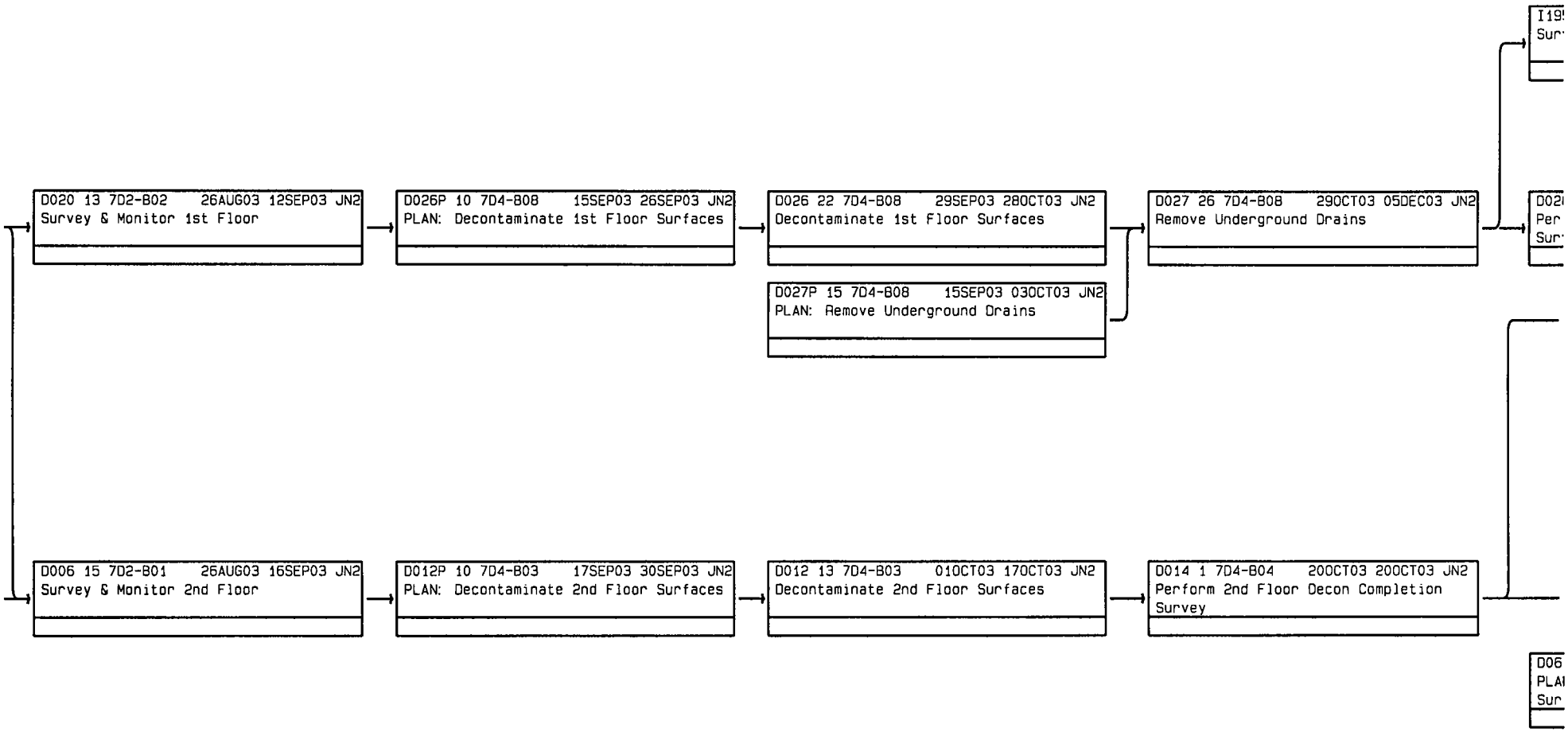
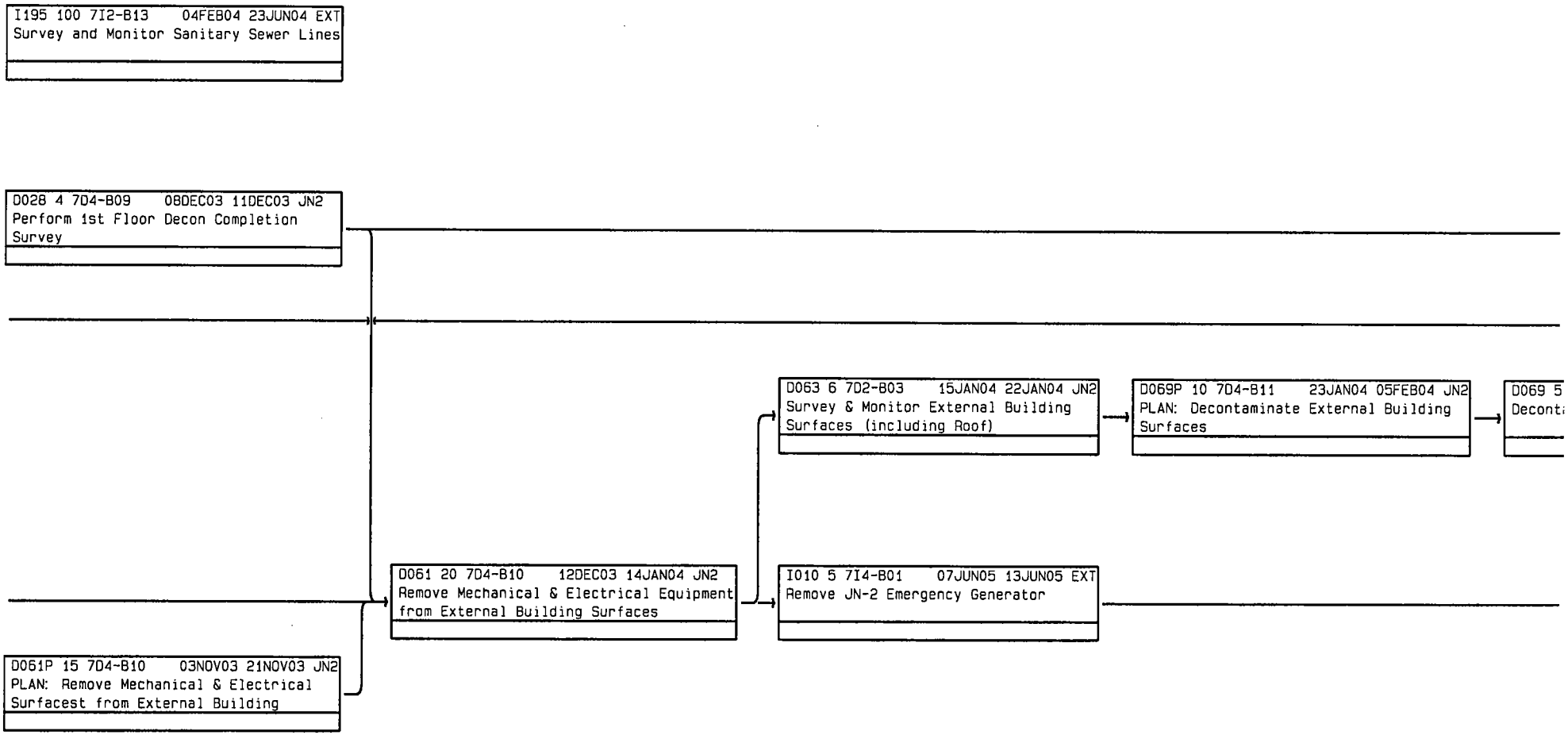
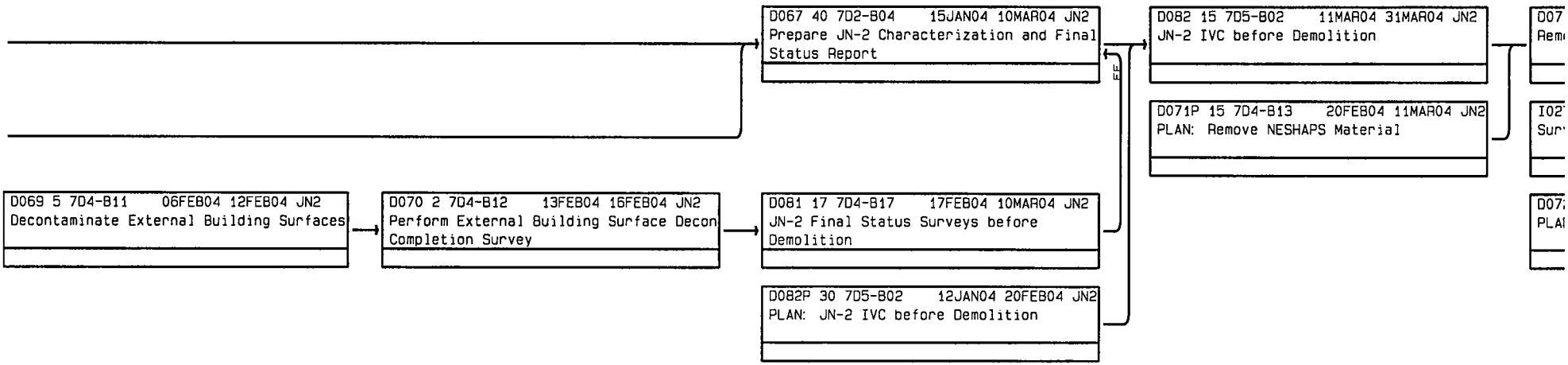


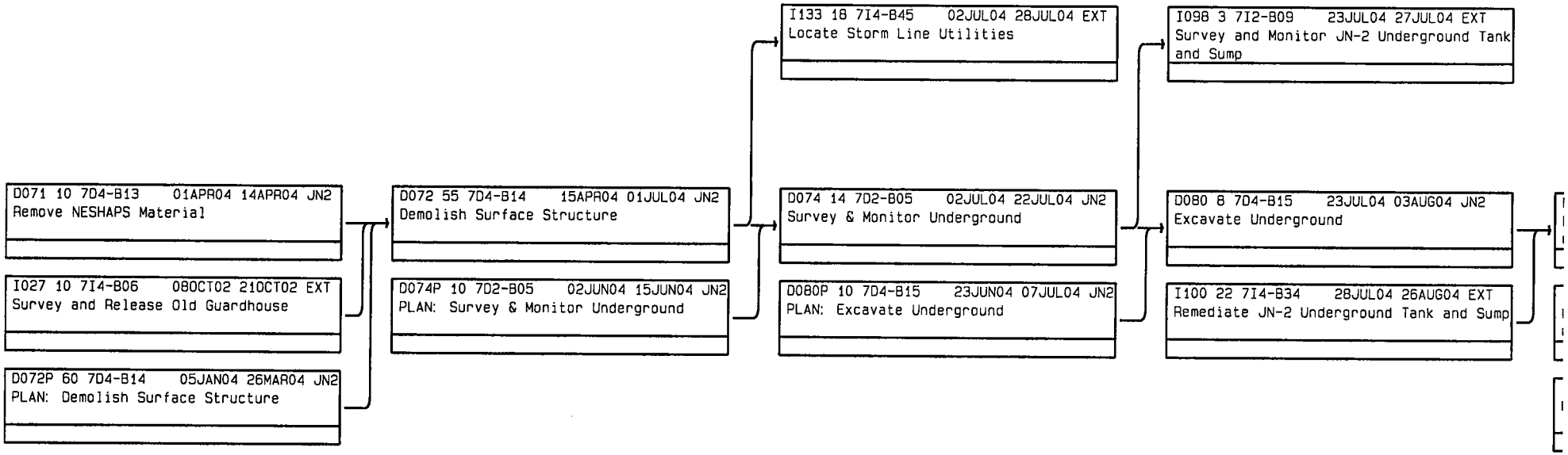
A2

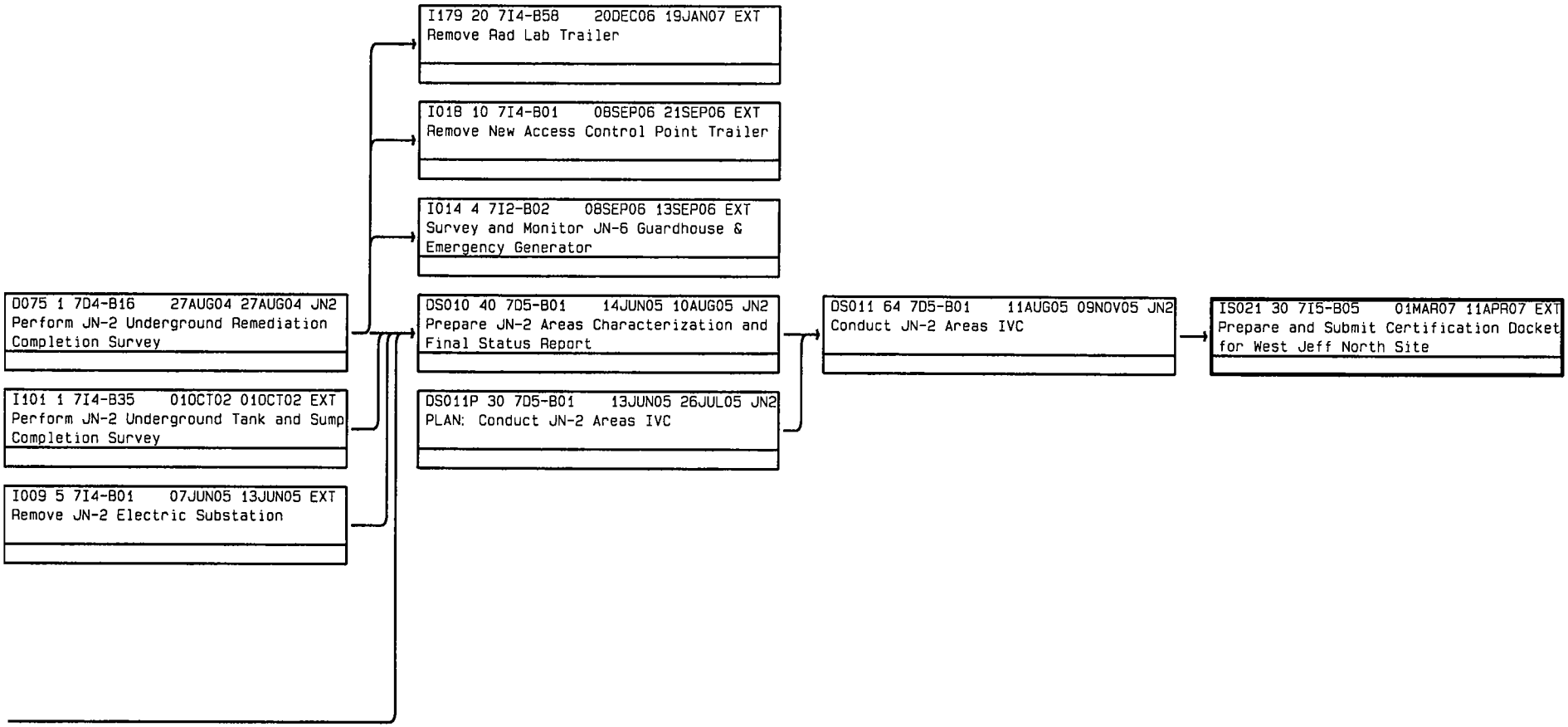

D020 13 7D2-B02 26AUG03 12SEP03 JN2
Survey & Monitor 1st Floor
D026P 10 7D4-B08 15SEP03 26SEP03 JN2
PLAN: Decontaminate 1st Floor Surfaces
D026 22 7D4-B08 29SEP03 28OCT03 JN2
Decontaminate 1st Floor Surfaces
D027 26 7D4-B08 29OCT03 05DEC03 JN2
Remove Underground Drains
D027P 15 7D4-B08 15SEP03 03OCT03 JN2
PLAN: Remove Underground Drains
D006 15 7D2-B01 26AUG03 16SEP03 JN2
Survey & Monitor 2nd Floor
D012P 10 7D4-B03 17SEP03 30SEP03 JN2
PLAN: Decontaminate 2nd Floor Surfaces
D012 13 7D4-B03 01OCT03 17OCT03 JN2
Decontaminate 2nd Floor Surfaces
D014 1 7D4-B04 20OCT03 20OCT03 JN2
Perform 2nd Floor Decon Completion
Survey


I195 100 7I2-B13 04FEB04 23JUN04 EXT
Survey and Monitor Sanitary Sewer Lines
D028 4 7D4-B09 08DEC03 11DEC03 JN2
Perform 1st Floor Decon Completion Survey
D063 6 7D2-B03 15JAN04 22JAN04 JN2
Survey & Monitor External Building Surfaces (including Roof)
D069P 10 7D4-B11 23JAN04 05FEB04 JN2
PLAN: Decontaminate External Building Surfaces
D069 5
Deconti
D061 20 7D4-B10 12DEC03 14JAN04 JN2
Remove Mechanical & Electrical Equipment from External Building Surfaces
I010 5 7I4-B01 07JUN05 13JUN05 EXT
Remove JN-2 Emergency Generator
D061P 15 7D4-B10 03NOV03 21NOV03 JN2
PLAN: Remove Mechanical & Electrical Surfacest from External Building

A4


D067 40 7D2-B04 15JAN04 10MAR04 JN2
Prepare JN-2 Characterization and Final Status Report
D082 15 7D5-B02 11MAR04 31MAR04 JN2
JN-2 IVC before Demolition
D071P 15 7D4-B13 20FEB04 11MAR04 JN2
PLAN: Remove NESHAPS Material
FF
D069 5 7D4-B11 06FEB04 12FEB04 JN2
Decontaminate External Building Surfaces
D070 2 7D4-B12 13FEB04 16FEB04 JN2
Perform External Building Surface Decon Completion Survey
D081 17 7D4-B17 17FEB04 10MAR04 JN2
JN-2 Final Status Surveys before Demolition
D082P 30 7D5-B02 12JAN04 20FEB04 JN2
PLAN: JN-2 IVC before Demolition


D071 10 7D4-B13 01APR04 14APR04 JN2
Remove NESHAPS Material
I027 10 7I4-B06 08OCT02 21OCT02 EXT
Survey and Release Old Guardhouse
D072P 60 7D4-B14 05JAN04 26MAR04 JN2
PLAN: Demolish Surface Structure
D072 55 7D4-B14 15APR04 01JUL04 JN2
Demolish Surface Structure
D074P 10 7D2-B05 02JUN04 15JUN04 JN2
PLAN: Survey & Monitor Underground
I133 18 7I4-B45 02JUL04 28JUL04 EXT
Locate Storm Line Utilities
D074 14 7D2-B05 02JUL04 22JUL04 JN2
Survey & Monitor Underground
D080P 10 7D4-B15 23JUN04 07JUL04 JN2
PLAN: Excavate Underground
I098 3 7I2-B09 23JUL04 27JUL04 EXT
Survey and Monitor JN-2 Underground Tank and Sump
D080 8 7D4-B15 23JUL04 03AUG04 JN2
Excavate Underground
I100 22 7I4-B34 28JUL04 26AUG04 EXT
Remediate JN-2 Underground Tank and Sump


I179 20 7I4-B58 20DEC06 19JAN07 EXT
Remove Rad Lab Trailer
I018 10 7I4-B01 08SEP06 21SEP06 EXT
Remove New Access Control Point Trailer
I014 4 7I2-B02 08SEP06 13SEP06 EXT
Survey and Monitor JN-6 Guardhouse & Emergency Generator
D075 1 7D4-B16 27AUG04 27AUG04 JN2
Perform JN-2 Underground Remediation Completion Survey
DS010 40 7D5-B01 14JUN05 10AUG05 JN2
Prepare JN-2 Areas Characterization and Final Status Report
DS011 64 7D5-B01 11AUG05 09NOV05 JN2
Conduct JN-2 Areas IVC
IS021 30 7I5-B05 01MAR07 11APR07 EXT
Prepare and Submit Certification Docket for West Jeff North Site
I101 1 7I4-B35 01OCT02 01OCT02 EXT
Perform JN-2 Underground Tank and Sump Completion Survey
DS011P 30 7D5-B01 13JUN05 26JUL05 JN2
PLAN: Conduct JN-2 Areas IVC
I009 5 7I4-B01 07JUN05 13JUN05 EXT
Remove JN-2 Electric Substation

☐ JN-1 ☒ JN-2 ☐ JN-3 ☐ Ext. Area ☐ Env. Mtr. ☐ Samples ☐ TRU/Waste ☐ Release Site

**Activity No.:** D002 **Work Pkg. No.:** 7D4-B01

**Function Name:** Remove 2nd floor material

**Component Name:** 2nd floor of JN-2

**Function Description:** Waste and non-structural materials will be removed from the uncontrolled areas of the 2nd floor of JN-2.

## Basis of Estimate

**Strategy for Accomplishing Function:** Uncontrolled areas will be verified as "clean" using gross Massilin smears and direct surveys for fixed contamination. Only when contamination is found in an area will items in the area undergo the free release process. Items from controlled areas will be evaluated for the feasibility of free releasing vs. disposal as LLW.

**Applicable Requirements/Procedures:**

BCLDP-90-1 & 2; DD-90-02; DD-93-02 & 04; HP-AP-1.0, 2.0, 5.0, 8.0, & 9.0; HS-AP-5.0 & 29.0; HP-OP-011, 012, 017, 018, & 019; HS-OP-001; MA-AP-20.1; PR-AP-17.1; QD-AP-5.2 & 6.1; TD-AP-2.0 & 3.0; WA-OP-006 & 020

**Input Descriptions:**

1. Vacated second floor rooms (3494 sq ft)
2. Approved Work Instruction

| | | | |
|---|---|---|---|
| Desks, Chairs, & tables | 1241 cu ft | Lockers | 31.5 cu ft |
| Files and cabinets | 757 cu ft | Blinds & Misc. | 207 cu ft |
| Elect. Appliances | 105 cu ft | Shelves | 435 cu ft |
| Paper | 21 cu ft | | |

**Output Descriptions:**

1. Completed WI package for activity D016.
2. 2nd floor of JN-2 minus removable material

| | | | |
|---|---|---|---|
| Reusable material | 2170 cu ft | LLW metal | 60 cu ft |
| Job Control Waste (comp) | 8 cu ft | Clean metal | 360 cu ft |
| Clean plastic, & misc. waste | 207 | Hazardous Waste | 01 cu ft |

**Assumptions:**

1. The planning and review time for material removal from both the 2nd floor and penthouse landing of JN-2 is estimated in this activity.
2. All non-structural and non-utility waste and material will be removed from JN-2 2nd floor.
3. Some items with inaccessible surfaces will be disposed of as LLW due to the cost of free releasing the items.
4. Hazardous waste will be old cleaning products that are estimated to be 1 cu ft.
5. No mixed waste is anticipated.
6. HP will conduct a pre job survey to discover the radiological conditions of the room or area.
7. File cabinets that contain historical information will require more time to release them than a gross Massilin and general frisk. 2 of these file cabinets have been estimated to need free released. 1½ days of HP time per the two file cabinets.

**Estimated Time to Plan the Work (Including Review and Approval):** 10 days

### Estimated Resources Required to Plan the Work

| Labor Type | Code | Persons/Days/Hours |
|---|---|---|
| Manager/Senior Staff | HBB | 1 / 4 / 4 * |
| Technical Advisors | HBTA | 1 / 10 / 10 |
| Project Manager/HP Manager | HBPM | 2 / 10 / 20  1 / 4 / 4 * |
| Task Leader | HBTL | 1 / 10 / 10 |
| Secretary/Clerical | HBS | 1 / 5 / 5 |
| Support Professional | HBP | |
| Bartlett Health Physics | HRH | 1 / 5 / 5 |
| | | |
| | | |

* Additional review time for Level 2 hazard rating.

**Estimated Time to Perform the Work:** 10 Days

**Estimated Resources Required to Perform the Work**

| Labor Type | Code | Persons/Days/Hours | PPE/Laundry Group | Total Jumps |
|---|---|---|---|---|
| Program Manager | HBA | | | |
| Manager/Senior Staff | HBB | | | |
| Technical Advisors | HBTA | 1 /10 / 10 | | |
| Project Manager/HP Manager | HBPM | 2 / 10 / 40 | Group 0 | 10 |
| Task Leader | HBTL | 1 / 10 / 80 | | |
| Battelle Technician | HBT | 1 / 10 / 10 | | |
| Battelle Technician O/T | HBTO | | | |
| RAL Staff | HBL | | | |
| Support Professional | HBP | | | |
| Secretary/Clerical | HBS | | | |
| Decon Ops Hourly | HBH | | | |
| BCO Support | HBCO | | | |
| BCO Skilled Laborer | HCE | 1 / 1 / 8 | | |
| BCO Skilled Laborer O/T | HCEO | | | |
| BCO Facility Manager | HCF | | | |
| | | | | |
| Bartlett Technician | HRD | 4 / 10 / 320 | Group 0 | 10 |
| Bartlett Maint Specialist | HRDS | 1 / 10 / 20 | N/A | 4 |
| Bartlett Health Physics | HRH | 2 / 10 / 160 | Group 0 | 10 |
| Bartlett Admin Support | HRA | | | |
| | | | | |

**Subcontract/Purchased Service:**. N/A

**Special Equipment/Material:** Freon evacuations system needed to remove refrigerant prior to disposing of refrigerator
**Comments/Explanations:**

**Basis of Estimate:**

**What is the estimator's experience?** Twenty-five years of nuclear submarine operations and repair. Planning, nuclear quality assurance, and nuclear repair planning.

**What experience is directly related to BCLDP?** Nine years of training, and two and half years of project management in JN-3.

**Did we apply a complexity factor during our thought process?** No complexity factor applied to this estimate

**Completed by:** C. A. Brenner **Date:** 05/03/02 **Rev. No.:** 1

Activity Number: D002

☐ JN-1 ☒ JN-2 ☐ JN-3 ☐ Ext. Area ☐ Env. Mtr. ☐ Samples ☐ TRU/Waste ☐ Release Site

**Activity No.:** D003 **Work Pkg. No.:** 7D4-B02

**Function Name:** Remove 2nd Floor Utilities, Hoods, Ducts and Piping

**Component Name:** JN-2 Second Floor

**Function Description:** Dismantle & remove HVAC systems, hoods, ductwork, plumbing & electrical systems to expose building surfaces for characterization, decontamination and final demolition.

## Basis of Estimate

**Strategy for Accomplishing Function:** Manual removal of systems using appropriate tools and equipment according to Work Instruction, RWP, Safety & WM Checklists. Materials will be surveyed and evaluated for free release by HP technician.

**Applicable Requirements/Procedures:**

BCLDP-90-2; DD-90-02; DD-93-02 & 04; DD-OP-029, 102,110, 116, & 217; HP-AP-1.0, 2.0, 5.0, 8.0, 9.0, 19.0, & 29.0; HP-OP-011, 012, 017, 018, & 019; HS-AP-2.0, 4.0, & 5.0; HS-OP-001; MA-AP-20.1; PR-AP-17.1; QD-AP-5.2 & 6.1; SIH-PP-04 & 06; TD-AP-2.0 & 3.0; WA-OP-006 & 020.

**Input Descriptions:**

Vacated second floor rooms (3494 sq ft), Waste containers, approved WI

| | | | |
|---|---|---|---|
| Air Conditioners | 96 $ft^3$ | Bench tops | 30 $ft^3$ |
| Lamp ballasts | 9 $ft^3$ | Lamp fixtures | 324 $ft^3$ |
| Fluor tubes | 26 $ft^3$ | Supply piping | 37 $ft^3$ |
| Ducting | 69 $ft^3$ | Drain piping | 4 $ft^3$ |
| Registers | 360 $ft^3$ | | |
| Fume hood | 216 $ft^3$ | Showers | 21 $ft^3$ |
| Hoist | 12 $ft^3$ | Sinks & toilets | 47 $ft^3$ |
| Lab benches | 450 $ft^3$ | Transformer | 48 $ft^3$ |

**Output Descriptions:**

Second floor minus utilities, completed WI data package, containerized utility waste:

| | | | |
|---|---|---|---|
| Misc. clean metal | 1327 $ft^3$ | Pb/Hg waste | 30 $ft^3$ |
| LLW metal | 285 $ft^3$ | Ceramic waste | 174 $ft^3$ |
| PCB waste | 9 $ft^3$ | Job control waste (comp) | 39 $ft^3$ |

**Assumptions:**

1. Most materials except hoods, ducts, & drain piping can be free released for disposal.
2. Areas will remain uncontrolled unless contamination found.
3. Production rate is approximately 200 sq ft per day with one crew.

**Estimated Time to Plan the Work (Including Review and Approval):** 10 days.

### Estimated Resources Required to Plan the Work

*In the following table, for each appropriate labor type enter the # of Persons involved in planning the activity, the # of Days (full or partial) they will be involved, and the total # of person-Hours necessary to plan the work, e.g., 2/5/36*

| Labor Type | Code | Persons/Days/Hours |
|---|---|---|
| Manager/Senior Staff | HBB | 1 / 1 / 4* |
| Technical Advisors | HBTA | 1 / 10 / 10 |
| Project Manager/HP Manager | HBPM | 2 / 10 / 40 1 / 1 / 4* |
| Task Leader | HBTL | 1 / 5 / 5 |
| Secretary/Clerical | HBS | 1 / 5 / 5 |
| Support Professional | HBP | |
| Bartlett Health Physics | HRH | 1 / 5 / 5 |
| | | |
| | | |

* Additional review time for Level 2 hazard rating.

**Estimated Time to Perform the Work:** 20 days

**Estimated Resources Required to Perform the Work**

*In the following table, for each appropriate labor type enter the # of Persons working on the activity, the # of Days (full or partial) they are involved, and the total # of Hours necessary to actually perform the work; the PPE/Laundry Group to be used during the performance of the work; and the Total # of Jumps; e.g., 4/20/640 Group 1 160*

| Labor Type | Code | Persons/Days/Hours | PPE/Laundry Group | Total Jumps |
|---|---|---|---|---|
| Program Manager | HBA | | | |
| Manager/Senior Staff | HBB | | | |
| Technical Advisors | HBTA | 1 / 20 / 20 | | |
| Project Manager/HP Manager | HBPM | 2 / 20 / 60 | | |
| Task Leader | HBTL | 1 / 20 /160 | Group 0 | 20 |
| Battelle Technician | HBT | 1 / 10 / 10 | Group 0 | 10 |
| Battelle Technician O/T | HBTO | | | |
| RAL Staff | HBL | | | |
| Support Professional | HBP | | | |
| Secretary/Clerical | HBS | | | |
| Decon Ops Hourly | HBH | | | |
| BCO Support | HBCO | | | |
| BCO Skilled Laborer | HCE | 1 / 5 / 16 | Group 0 | 5 |
| BCO Skilled Laborer O/T | HCEO | | | |
| BCO Facility Manager | HCF | | | |
| | | | | |
| Bartlett Technician | HRD | 4 / 20 / 640 | Group 0 | 80 |
| Bartlett Maint Specialist | HRDS | 1 / 20 / 40 | Group 0 | 20 |
| Bartlett Health Physics | HRH | 1 / 20 / 120 | Group 0 | 20 |
| Bartlett Admin Support | HRA | | | |
| | | | | |

**Subcontract/Purchased Service:**

**Special Equipment/Material:** N/A

**Comments/Explanations:**

**Basis of Estimate:**

**What is the estimator's experience?** Twenty-five years of nuclear submarine operations and repair. Planning, nuclear quality assurance, and nuclear repair planning.
**What experience is directly related to BCLDP?** Nine years of training, and one and

half years of project management in JN-3.
**Did we apply a complexity factor during our thought process?** No complexity factor applied to this estimate

**Completed by:** C. A. Brenner/D Seifert **Date:** 5/8/02 **Rev. No.:** 2

☐ JN-1 ☒ JN-2 ☐ JN-3 ☐ Ext. Area ☐ Env. Mtr. ☐ Samples ☐ TRU/Waste ☐ Release Site

**Activity No.:** D004 **Work Pkg. No.:** 7D4-B02

**Function Name:** Remove first and second floor asbestos material

**Component Name:** 2nd floor of JN-2.

**Function Description:** Asbestos abatement subcontractor will remove asbestos containing materials such as floor tile/mastic, ceiling tile and pipe insulation from first and second floors of JN-2.

## Basis of Estimate

**Strategy for Accomplishing Function:** Procure asbestos abatement subcontractor to accomplish task.

**Applicable Requirements/Procedures:**

Approved work instruction; Contract for asbestos abatement contractor; BCLDP-90-1; DD-93-04, 05, & 11; HP-AP-1.0, 2.0, 5.0, 8.0, 9.0, & 19.0; HP-OP-011, 012, 017, 018, 019, 023, & 106; HS-AP-4.0, & 5.0; HS-OP-001; MA-AP-20.1; PR-AP-17.1; QD-AP-4.1; 5.2, 6.1, & 7.1; SIH-PP-04 & 09; TD-AP-2.0, & 3.0; WA-OP-022

**Input Descriptions:**

1. JN-2 2nd floor less non-structural materials
2. Suspended ceiling – 972 sq. ft.
3. Floor tile – 1688 sq. ft.
4. Pipe insulation – 50 lin. Ft.

**Output Descriptions:**

1. JN-2 2nd floor less internal asbestos materials
2. Non metal ceiling waste – 194 cu. ft.
3. ACM/LLW tiles – 34 cu. ft.
4. Metal ceiling grids – 10 cu. ft.
5. Pipe insulation – 50 cu. ft.
6. Job waste (compactable) – 47 cu. ft.
7. Asbestos release surveys and air sample results (if required).

**Assumptions:**

1. Second floor ceiling tiles assumed to be asbestos containing materials
2. Floor tile/mastic assumed to be asbestos containing materials.
3. Price quote assumes work to be performed in FY 2001.
4. Price quote based on building walk down with asbestos abatement contractor for the purposes of estimating costs.
5. No material samples for asbestos content have been taken at this time.
6. 1st floor is available for 2nd floor completion.
7. 1st floor ceiling tiles are non-asbestos containing material.

**Estimated Time to Plan the Work (Including Review and Approval):** Planning time of 15 days includes notification to ODOH and OEPA of abatement activities.

### Estimated Resources Required to Plan the Work

*In the following table, for each appropriate labor type enter the # of Persons involved in planning the activity, the # of Days (full or partial) they will be involved, and the total # of person-Hours necessary to plan the work, e.g., 2/5/36*

| Labor Type | Code | Persons/Days/Hours |
|---|---|---|
| Manager/Senior Staff | HBB | |
| Technical Advisors | HBTA | 1/10/5 |
| Project Manager/HP Manager | HBPM | 2/15/30 |
| Task Leader | HBTL | 1/15/20 |
| Secretary/Clerical | HBS | 1/10/5 |
| Support Professional | HBP | |
| Bartlett Health Physics | HRH | 1/5/5 |
| | | |
| | | |

**Estimated Time to Perform the Work:** Approximately 15 days to perform the work which includes set up and take down and time to gather and analyze air samples to release area after abatement

### Estimated Resources Required to Perform the Work

*In the following table, for each appropriate labor type enter the # of Persons working on the activity, the # of Days (full or partial) they are involved, and the total # of Hours necessary to actually perform the work; the PPE/Laundry Group to be used during the performance of the work; and the Total # of Jumps; e.g., 4/20/640 Group 1 160*

| Labor Type | Code | Persons/Days/Hours | PPE/Laundry Group | Total Jumps |
|---|---|---|---|---|
| Program Manager | HBA | | | |
| Manager/Senior Staff | HBB | | | |
| Technical Advisors | HBTA | | | |
| Project Manager/HP Manager | HBPM | 2/15/30 | N/A | |
| Task Leader | HBTL | 1/15/40 | N/A | |
| Battelle Technician | HBT | 1/15/15 | | |
| Battelle Technician O/T | HBTO | | | |
| RAL Staff | HBL | | | |
| Support Professional | HBP | | | |
| Secretary/Clerical | HBS | | | |
| Decon Ops Hourly | HBH | | | |
| BCO Support | HBCO | | | |
| BCO Skilled Laborer | HCE | | | |
| BCO Skilled Laborer O/T | HCEO | | | |
| BCO Facility Manager | HCF | | | |
| | | | | |
| Bartlett Technician | HRD | 2/15/90 | Group 0 | 30 |
| Bartlett Maint Specialist | HRDS | | | |
| Bartlett Health Physics | HRH | 1/15/60 | Group 0 | 15 |
| Bartlett Admin Support | HRA | | | |
| Asbestos abate. Subcon. | | 500 manhours | Group 2 | 75 |

**Subcontract/Purchased Service:** Asbestos abatement subcontractor (AHC Inc.) estimate from 5/16/00 of $32,583.

**Special Equipment/Material:** Scaffold, ladders and manlifts, HEPA filtering units, and PPE i.e., clothing and respirators. All other material supplied by subcontractor.

**Comments/Explanations:**

**Basis of Estimate:**

**What is the estimator's experience?** Twenty-five years of nuclear submarine operations and repair. Planning, nuclear quality assurance, and nuclear repair planning.

**What experience is directly related to BCLDP?** Nine years of training, and one and half years of project management in JN-3.
**Did we apply a complexity factor during our thought process?** No complexity factor applied to this estimate

**Completed by:** C.A. Brenner/D. Seifert **Date:** 05/2/02 **Rev. No.:** 2

☐JN-1 ☒ JN-2 ☐ JN-3 ☐ Ext. Area ☐ Env. Monit. ☐ Sample Analysis ☐ Waste Mgmt

**Activity No.:** D006 **Work Pkg. No.:** 7D2-B01

**Function Name:** Survey and Monitor 2nd Floor

**Component Name:** JN-2 Second Floor

**Function Description:** Baseline Characterization of the 2nd Floor of JN-2

## Basis of Estimate

**Strategy for Accomplishing Function:** Perform Baseline Characterization consistent with NUREG 5849

**Applicable Requirements/Procedures/Work Instructions:**

NUREG 5849 "Manual for Conducting Radiological Surveys in Support of License Termination"; Characterization & Final Status Plan for the West Jefferson North Site; DD-CP-002, 004, 010, & 030; DD-90-02; DD-93-04; DD-97-02; HP-AP-1.0, 2.0, 5.0, 8.0, 9.0, & 19.0; HP-OP-011, 012, 017, 018, & 019; HS-AP-4.0 & 5.0; HS-OP-001; MA-AP-20.1; PR-AP-17.1; QD-AP-5.2 & 6.1; RL-AP-1.0; TD-AP-2.0 & 3.0

**Input Descriptions:**

1. Rooms and Areas that have undergone material and M&E removal
2. Approved Work Instruction

**Output Descriptions:**

1. Establish Building Material Radiological Background
2. Material Decision Level Values Established
3. Smears to lab 1per 3grids (~400total); gross alpha/beta
4. 16 sediment & solid samples to lab; gamma spec
5. data to report generation
6. 2 alpha isotopic samples.

**Assumptions:**

Establish Building Material Background & Decision Level Values :

1. 10 types of materials are present
2. (40) 1 minute measurements for alpha & beta window per material
3. (40) 1 minute measurements for alpha activity per material
4. 3 minute prep/setup/taking floor readings (60%) = 24 hr
5. 5 minute prep/setup/taking wall readings (20%) = 13.3 hr
6. 10 minute prep/setup/taking lift readings (20%) = 26.7 hr
7. 1.25 hr to establish DLV for each material ( spreadsheet) = 12.5 hr
8. Instrument Tech @ 10%
9. No significant downtime

Survey:

1. 100% of all floor area will be surveyed.
2. 100% of all wall area up to 2m will be surveyed.
3. 120% of all ceilings will be surveyed ( 20% added for horizontal surfaces)
4. 10%or 30sq. meters whichever is larger of wall areas greater than 2m will be monitored
5. Normal rate for characterization surveys is 6 square meters per technician-hour
6. Ladder rate for characterization surveys is 5 square meters per technician-hour

7. Lift rate for characterization surveys is 4 square meters per technician-hour
8. Drain Samples 2/hr; 16 samples total / Penthouse Dimensions 22'x19'x48'
9. The rate for characterization surveys includes : 5cm/sec survey rate, documentation assess elevated levels>DLV, alpha, alpha + beta 2min counts required, perform smears.
10. Room & Area Volumes were taken from the REV3 Baseline waste volume inventory.
11. WI takes 16 hr to prepare/Safety Prof. 8hr for WI/SCL/8hr Rad/ALARA Rev. / 4 hr WM/ 8 hr 2 Mgr Rev./ 8 hr comment resolve/ 8 hr data clerk
12. 8 hrs to rent/procure lift
13. Instrument Repair & Calibration @ 10%
14. No Lift Failure; No significant downtime
15. Work Instruction includes D006, D014, D020, D028, D063,D067,D070,d081

Data Technician:

1. Technician inputs 3 data values for each grid into spreadsheet
2. Technician also performs QA/QC for data input & data sheets
3. Technician identifies grids above release criteria & background
4. Floor 2 estimated to have 1175 grids---800 smear results.

**Estimated Time to Plan the Work (Including Review and Approval):** 5 days for WI

**Estimated Resources Required to Plan the Work**

| Labor Type | Code | Persons/Days/Hours |
|---|---|---|
| Manager/Senior Staff | HBB | 3/5/32 |
| Technical Advisors | HBTA | 3/3/20 |
| Project Manager/HP Manager | HBPM | |
| Task Leader | HBTL | |
| Secretary/Clerical | HBS | 1/1/8 |
| Support Professional | HBP | |
| Bartlett Health Physics | HRH | |
| | | |
| | | |

**Estimated Time to Perform the Work:** 15 days to perform surveys & sampling

**Estimated Resources Required to Perform the Work**

| Labor Type | Code | Persons/Days/Hours | PPE/Laundry Group | Total Jumps |
|---|---|---|---|---|
| Program Manager | HBA | | NA | NA |
| Manager/Senior Staff | HBB | 1/15/30 | NA | NA |
| Technical Advisors | HBTA | 1/14/14 | NA | NA |
| Project Manager/HP Manager | HBPM | | | |
| Task Leader | HBTL | 1/15/60 | 0 | 14 |
| Battelle Technician | HBT | 1/11/88 | 0 | 14 |
| Battelle Technician O/T | HBTO | | | |
| RAL Staff | HBL | | | |
| Support Professional | HBP | 1/1/8 | NA | NA |
| Secretary/Clerical | HBS | | | |
| Decon Ops Hourly | HBH | | | |
| BCO Support | HBCO | | | |

| | | | | |
|---|---|---|---|---|
| BCO Skilled Laborer | HCE | | | |
| BCO Skilled Laborer O/T | HCEO | | | |
| BCO Facility Manager | HCF | | | |
| | | | | |
| Bartlett Technician | HRD | | | |
| Bartlett Maint Specialist | HRDS | | | |
| Bartlett Health Physics | HRH | 3/14/336<br>1/14/12<br>1/15/100 | 0<br>NA<br>NA | 42<br>NA<br>NA |
| Bartlett Admin Support | HRA | | | |

**Subcontract/Purchased Service:** None identified

**Special Equipment/Material:**

**Comments/Explanations:**
**Basis of Estimate**
**What is the estimator's experience?**
15 years of health physics & radiological release program management

**What experience is directly related to the BCLDP?**
10 years of BCLDP characterization & radiological release program experience, 2 years at West Jefferson

**Was a complexity factor applied?**
Worked is similar to KA-2 & KA-3 and no complexity factor was utilized.

**Completed by:** J.F. POLIZIANI **Date:** 5/07/01 **Rev. No:** 2

☐JN-1 ☒ JN-2 ☐ JN-3 ☐ Ext. Area ☐ Env. Monit. ☐ Sample Analysis ☐ Waste Mgmt

**Activity No.:** D012 **Work Pkg. No.:** 7D4-B03

**Function Name:** Decontaminate 2nd Floor Surfaces

**Component Name:** JN-2 Second Floor

**Function Description:** Assemble material resources & work crews and decontaminate designated surfaces according to work instruction.

## Basis of Estimate

**Strategy for Accomplishing Function:** Brief work crews on scope of activities, procedures, radiological & safety concerns and requirements. Assemble materials, equipment and supplies; institute radiological and engineering controls & perform decontamination activities encompassing washing/wiping and scabbling of surfaces with Characterization support to monitor progress and determine completion.

### Applicable Requirements/Procedures/Work Instructions:

DD-90-02; DD-93-02 & 04; DD-CP-004& 030; DD-OP-029, 065, 075, 077, 195, & 215; HP-AP-1.0, 2.0,5.0, 8.0, 9.0, 11.0, 15.0, & 19.0; HP-OP-011, 012, 017, 018, 019, & 023; HS-AP-2.0, 4.0, & 5.0; HS-OP-001; MA-AP-20.1; PR-AP-17.1; QD-AP-5.2 & 6.1; SM-OP-001; TD-AP-2.0 &3.0; WA-OP-020

### Input Descriptions:

1. Demarcated second floor building surfaces for decontamination (100 sq ft floors, 100 sq ft walls)
2. Characterization data
3. Decon equipment: Hilti guns, HEPA Vacs, portable enclosures, waste containers.
4. Approved Work Instruction.

### Output Descriptions:

1. Second floor surfaces minus contamination
2. Completion survey data
3. Completed Work Instruction data package
4. Containerized LLW:
   - Concrete rubble & HEPA filters – 12 cu ft
   - Job waste (compactable) – 99 cu ft

### Assumptions:

1. Building surface contamination is 2.5% of floors and 1% of walls (200 sq ft total) distributed among 8 rooms.
2. No contamination is found on ceilings, hallways.
3. Contamination can be removed using Group 1 PPE by employing hooded HEPA enclosures at point of contact.
4. Production rate is approximately 25 sq ft per day with 1 crew.
5. Air system for pneumatic decon tools must be established. Moving and testing approx. 5 days.

**Estimated Time to Plan the Work (Including Review and Approval):** 10 days

### Estimated Resources Required to Plan the Work

*In the following table, for each appropriate labor type enter the # of Persons involved in planning the activity, the # of Days (full or partial) they will be involved, and the total # of person-Hours necessary to plan the work, e.g., 2/5/36*

| Labor Type | Code | Persons/Days/Hours |
|---|---|---|
| Manager/Senior Staff | HBB | |
| Technical Advisors | HBTA | 1 / 10 / 5 |
| Project Manager/HP Manager | HBPM | 1 / 10 / 20 |
| Task Leader | HBTL | 1 / 10 /10 |
| Secretary/Clerical | HBS | 1 / 5 / 5 |
| Support Professional | HBP | |
| Bartlett Health Physics | HRH | 1 / 5 / 5 |
| | | |
| | | |

**Estimated Time to Perform the Work:** 13 days

**Estimated Resources Required to Perform the Work**

*In the following table, for each appropriate labor type enter the # of Persons working on the activity, the # of Days (full or partial) they are involved, and the total # of Hours necessary to actually perform the work; the PPE/Laundry Group to be used during the performance of the work; and the Total # of Jumps; e.g., 4/20/640 Group 1 160*

| Labor Type | Code | Persons/Days/Hours | PPE/Laundry Group | Total Jumps |
|---|---|---|---|---|
| Program Manager | HBA | | | |
| Manager/Senior Staff | HBB | | | |
| Technical Advisors | HBTA | 1 / 13 / 13 | N/A | |
| Project Manager/HP Manager | HBPM | 2 / 13 /52 | N/A | |
| Task Leader | HBTL | 1 / 13 / 104 | Group 1 | 16 |
| Battelle Technician | HBT | 1 / 13 / 13 | | |
| Battelle Technician O/T | HBTO | | | |
| RAL Staff | HBL | | | |
| Support Professional | HBP | | | |
| Secretary/Clerical | HBS | | | |
| Decon Ops Hourly | HBH | | | |
| BCO Support | HBCO | | | |
| BCO Skilled Laborer | HCE | 1 / 7 / 29 | Group 1 | 4 |
| BCO Skilled Laborer O/T | HCEO | | | |
| BCO Facility Manager | HCF | | | |
| | | | | |
| Bartlett Technician | HRD | 5 / 13 / 520 | Group 1 | 130 |
| Bartlett Maint Specialist | HRDS | 1 / 13 / 26 | Group 1 | 8 |
| Bartlett Health Physics | HRH | 2 / 13 / 156 | Group 1 | 39 |
| Bartlett Admin Support | HRA | | | |
| | | | | |

**Subcontract/Purchased Service:** N/A

**Special Equipment/Material:** N/A

**Comments/Explanations:**

**Basis of Estimate:**

**What is the estimator's experience?** Twenty-five years of nuclear submarine operations and repair. Planning, nuclear quality assurance, and nuclear repair planning.

**What experience is directly related to BCLDP?** Nine years of training, and two and a half years of project management in JN-3.

**Did we apply a complexity factor during our thought process?** No complexity

factor applied to this estimate

**Completed by:** C.A. Brenner **Date:** 04/26/02 **Rev. No.:** 3

☐JN-1 ☒ JN-2 ☐ JN-3 ☐ Ext. Area ☐ Env. Monit. ☐ Sample Analysis ☐ Waste Mgmt

**Activity No.:** D014 **Work Pkg. No.:** 7D4-B04

**Function Name:** Perform 2nd Floor Decon Completion Survey

**Component Name:** JN-2 Second Floor

**Function Description:** Baseline Characterization of the 2nd Floor of JN-2

## Basis of Estimate

**Strategy for Accomplishing Function:** Perform Baseline Characterization consistent with NUREG 5849

**Applicable Requirements/Procedures/Work Instructions:**

NUREG 5849 "Manual for Conducting Radiological Surveys in Support of License Termination"; Characterization & Final Status Plan for the West Jefferson North Site; DD-CP-002, 004, 010, & 030; DD-93-04; DD-97-02; HS-AP-4.0 & 5.0; HS-OP-001; PR-AP-17.1; QD-AP-5.2 & 6.1; TD-AP-2.0

**Input Descriptions:**

1. Rooms and Areas that have undergone material removal, M&E removal, and decon.
2. Approved Work Instruction.

**Output Descriptions:**

1. Data to report generation
2. 20 smears; gross alpha/beta.

**Assumptions:**

1. 5% of all monitored areas were contaminated
2. Time for Interim Decon Effectiveness Surveys are part of the Decontamination Crew
3. 100% of all floor area were surveyed.
4. 100% of all wall area up to 2m were surveyed.
5. 120% of all ceilings were surveyed ( 20% added for horizontal surfaces)
6. 10%or 30sq. meters whichever is larger of wall areas greater than 2m were monitored
7. Normal rate for characterization surveys is 6 square meters per technician-hour
8. Ladder rate for characterization surveys is 5 square meters per technician-hour
9. Lift rate for characterization surveys is 4 square meters per technician-hour
10. Drain Samples 2/hr; 16 samples total
11. The rate for characterization surveys includes : 5cm/sec survey rate, documentation, assess elevated levels>DLV , alpha, alpha + beta 2min counts required, perform smears.
12. Room & Area Volumes were taken from the REV3 Baseline waste volume inventory.
13. Instrument Tech @ 10% Repair & Cal.

**Estimated Time to Plan the Work (Including Review and Approval):** 0 days; WI under D006

## Estimated Resources Required to Plan the Work

*In the following table, for each appropriate labor type enter the # of Persons involved in planning the activity, the # of Days (full or partial) they will be involved, and the total # of person-Hours necessary to plan the work, e.g., 2/5/36*

| Labor Type | Code | Persons/Days/Hours |
|---|---|---|
| Manager/Senior Staff | HBB | NA |
| Technical Advisors | HBTA | NA |
| Project Manager/HP Manager | HBPM | NA |
| Task Leader | HBTL | NA |
| Secretary/Clerical | HBS | NA |
| Support Professional | HBP | NA |
| Bartlett Health Physics | HRH | NA |

**Estimated Time to Perform the Work:** 1 work day for decon survey

**Estimated Resources Required to Perform the Work**

*In the following table, for each appropriate labor type enter the # of Persons working on the activity, the # of Days (full or partial) they are involved, and the total # of Hours necessary to actually perform the work; the PPE/Laundry Group to be used during the performance of the work; and the Total # of Jumps; e.g., 4/20/640 Group 1 160*

| Labor Type | Code | Persons/Days/Hours | PPE/Laundry Group | Total Jumps |
|---|---|---|---|---|
| Program Manager | HBA | | NA | NA |
| Manager / Senior Staff | HBB | 1/1/2 | | |
| Technical Advisors (Safety) | HBTA | 1/1/1 | NA | NA |
| Project Manager / HP Manager | HBPM | | | |
| Task LeaderSafety Prof. | HBTL | 1/1/4 | 0 | 1 |
| Battelle Technician (HP) | HBT | 1/1/8 | 0 | 1 |
| Battelle Technician O/T | HBTO | | | |
| RAL Staff | HBL | | | |
| Support Professional | HBP | | | |
| Secretary / Clerical | HBS | | | |
| Decon Ops Hourly | HBH | | | |
| BCO Support | HBCO | | | |
| BCO Skilled Laborer | HCE | | | |
| BCO Skilled Laborer O/T | HCEO | | | |
| BCO Facility Manager | HCF | | | |
| | | | | |
| Bartlett Technician | HRD | | | |
| Bartlett Maint Specialist | HRDS | | | |
| Bartlett Health Physics<br>(Instrument)<br>(Data) | HRH | 3/1/24<br>1/1/1<br>1/1/8 | 0<br>NA<br>NA | 3<br>NA<br>NA |
| Bartlett Admin Support | HRA | | | |

**Subcontract/Purchased Service:** None identified

**Special Equipment/Material:**

**Comments/Explanations: Basis of Estimate**

**What is the estimator's experience?**
15 years of health physics and radiological release program management

**What experience is directly related to BCLDP?**
10 years of BCLDP characterization & radiologicalrelease program experience; 2 years at West Jefferson

**Was a complexity factor used?**
Work is similar to KA-2 & KA-3, no complexity factor used

**Completed by:** J.F. POLIZIANI **Date:** 05/08/00 **Rev. No.:** 2

☐ JN-1 ☒ JN-2 ☐ JN-3 ☐ Ext. Area ☐ Env. Mtr. ☐ Samples ☐ TRU/Waste ☐ Release Site

**Activity No.:** D016 **Work Pkg. No.:** 7D4-B06

**Function Name:** Remove 1st floor material

**Component Name:** 1st floor of JN-2

**Function Description:** Waste and non-structural materials will be removed from the uncontrolled areas of the 1st floor of JN-2.

## Basis of Estimate

**Strategy for Accomplishing Function:** Uncontrolled areas will be verified as "clean" using gross Massillon smears and direct surveys for fixed contamination. Only when contamination is found in an area will items in the area undergo the free release process. Items from controlled areas will be evaluated for the feasibility of free releasing vs. disposal as LLW.

**Applicable Requirements/Procedures:**

BCLDP-90-1; BCLDP-90-2; DD-90-02; DD-93-02, 03, 04, & 05; HP-AP-1.0, 2.0, 5.0, 8.0, 9.0, 19.0, & 29.0; HP-OP-011, 012, 017, 018, 019, & 106; HS-AP-5.0; HS-OP-001; MA-AP-20.1; PR-AP-17.1; QD-AP-4.1, 5.2, 6.1, & 7.1; TD-AP-2.0 & 3.0; WA-OP-006, 020, & 022

**Input Descriptions:**

1. Approved Work Instruction from activity D002
2. 1st floor of JN-2 with existing material, waste and non-structural materials as described in Waste volumes & types FY 2001 and a physical walk down of the building.

| | | | |
|---|---|---|---|
| Chairs, Desks and cabinets | 1029 cu ft | Lab Cab & work benches | 1621 cu ft |
| Metal work boxes and shelves | 2275 cu ft | Lockers & 55 gal drums | 175 cu ft |
| Fork lifts | 6870 cu ft | Files and contents | 828 cu ft |
| Pallets and miscl. | 685 cu ft | Electrical components | 474 cu ft |
| Ovens & nit. Tank | 225 cu ft | | |

**Output Descriptions:**

1. Completed work instruction package
2. 1st floor of JN-2 minus removable material

| | | | |
|---|---|---|---|
| LLW metal | 1738 cu ft | LLW compactable | 487 cu ft |
| Non-radioactive waste | 2800 cu ft | Radioactive Gov. excess | 6224 cu ft |
| Reusable furniture | 1857 cu ft | Job Control Waste | 150 cu ft |
| Reusable work boxes | 1025 cu ft | Hazardous waste | 5 cu ft |

**Assumptions:**

1. All non-structural and non-utility waste and material will be removed from JN-2 1st floor.
2. 60% of the equipment in rooms 2106, 2106A, 2108, and 2108A and 95% of the equipment in room 2119 will be relocated to a new lab location.
3. The fume hood cabinets and other small equipment will be disposed of as LLW.
4. Chemicals will be free released and dispose of as hazardous waste
5. The file cabinets in room 2101 are field copies and can be thrown away.
6. The contaminated equipment in the highbay will be offered for reuse at another DOE facility.

**Estimated Time to Plan the Work (Including Review and Approval):** 10 days.

**Estimated Resources Required to Plan the Work**

| Labor Type | Code | Persons/Days/Hours |
|---|---|---|
| Manager/Senior Staff | HBB | 1 / 1 / 4* |
| Technical Advisors | HBTA | 1 / 10 / 10 |
| Project Manager/HP Manager | HBPM | 2 / 10 / 20 1 / 1 / 4* |
| Task Leader | HBTL | 1 / 10 / 10 |
| Secretary/Clerical | HBS | 1 / 5 / 5 |
| Support Professional | HBP | |
| Bartlett Health Physics | HRH | 1 / 5 / 5 |

* Additional review time for Level 2 hazard rating.

**Estimated Time to Perform the Work:** One crew 22 Days

**Estimated Resources Required to Perform the Work**

| Labor Type | Code | Persons/Days/Hours | PPE/Laundry Group | Total Jumps |
|---|---|---|---|---|
| Program Manager | HBA | | | |
| Manager/Senior Staff | HBB | | | |
| Technical Advisors | HBTA | 1 / 22 / 22 | | |
| Project Manager/HP Manager | HBPM | 2 / 22 / 88 | | |
| Task Leader | HBTL | 1 / 22 / 176 | Group 0 / Group 1 | 15/14 |
| Battelle Technician | HBT | 2 / 22 / 22 | Group 0 / Group 1 | 15 / 7 |
| Battelle Technician O/T | HBTO | | | |
| RAL Staff | HBL | | | |
| Support Professional | HBP | | | |
| Secretary/Clerical | HBS | | | |
| Decon Ops Hourly | HBH | | | |
| BCO Support | HBCO | | | |
| BCO Skilled Laborer | HCE | | | |
| BCO Skilled Laborer O/T | HCEO | | | |
| BCO Facility Manager | HCF | | | |
| | | | | |
| Bartlett Technician | HRD | 4 / 22 / 704 | Group 0 / Group 1 | 60 / 56 |
| Bartlett Maint Specialist | HRDS | 1 / 10 / 44 | Group 0 / Grooup1 | 6 / 4 |
| Bartlett Health Physics | HRH | 3 / 22 / 528 | Group 0 / Group 1 | 45 / 42 |
| Bartlett Admin Support | HRA | | | |
| | | | | |

**Subcontract/Purchased Service:**

**Special Equipment/Material:** N/A

**Comments/Explanations:**

**Basis of Estimate:**

**What is the estimator's experience?** Twenty-five years of nuclear submarine operations and repair. Planning, nuclear quality assurance, and nuclear repair planning.

**What experience is directly related to BCLDP?** Nine years of training, and two and a half years of project management in JN-3.

**Did we apply a complexity factor during our thought process?** No complexity factor applied to this estimate

**Completed by:** C. A. Brenner/D Seifert **Date:** 05/03/02 **Rev. No.:** 1

Activity Number: D016

☐JN-1 ☒ JN-2 ☐ JN-3 ☐ Ext. Area ☐ Env. Monit. ☐ Sample Analysis ☐ Waste Mgmt

**Activity No.:** D017 **Work Pkg. No.:** 7D4-B07

**Function Name:** Remove 1st Floor Utilities, Hoods, Ducts and Piping

**Component Name:** JN-2 First Floor

**Function Description:** Dismantle & remove HVAC systems, hoods, ductwork, plumbing & electrical systems to expose building surfaces for characterization, decontamination and final demolition.

## Basis of Estimate

**Strategy for Accomplishing Function:** Dismantle & remove HVAC systems, hoods, ductwork, plumbing & electrical systems to expose building surfaces for characterization, decontamination and final demolition.

**Applicable Requirements/Procedures/Work Instructions:**

BCLDP-90-2; DD-90-02; DD-93-02 & 04; DD-OP-029, 090, 102, 110, 116, & 217; HP-AP-1.0, 2.0, 5.0, 8.0, 9.0, 19.0, & 29.0; HP-OP-011, 012, 017, 018, & 019; HS-AP-2.0, 4.0, & 5.0; HS-OP-001; MA-AP-20.1; PR-AP-17.1; QD-AP-5.2 & 6.1; SIH-PP-04 & 06; SM-OP-001; TD-AP-2.0 & 3.0; WA-OP-006 7& 020

**Input Descriptions:**

Vacated first floor rooms (5030 sq ft), Waste containers, approved WI

| | | | |
|---|---|---|---|
| A/C unit | 24 cu ft | Lamp Ballasts | 6 cu ft |
| Bridge Crane | 258 cu ft | Fluorescent Tubes | 20 cu ft |
| Electrical Service | 105 cu ft | Ducting | 202 cu ft |
| Fume Hood | 1080 cu ft | Lab benches | 585 cu ft |
| Light Fixtures | 216 cu ft | Supply Piping | 220 cu ft |
| Drain Piping | 27 cu ft | Registers | 120 cu ft |
| Transformers | 96 cu ft | Stone Bench tops | 39 cu ft |
| Bath/Shower Ceramics | 118 cu ft | | |

**Output Descriptions:**

First floor minus utilities, Completed WI data package, Containerized utility waste:

| | | | |
|---|---|---|---|
| LLW metal waste | 2918 cu ft | PCB Waste | 6 cu ft |
| Pb/Hg waste | 47 cu ft | Ceram/Stone waste | 157 cu ft |
| Job Control Waste (comp.) | 365cu ft | | |

**Assumptions:**

1. All utilities on the first floor of JN-2 will be considered contaminated and will be disposed of as LLW.
2. All drain piping above the floor slab will be removed.
3. Production rate is approximately 100 sq ft of floor area per day in controlled/contaminated area.

**Estimated Time to Plan the Work (Including Review and Approval):** 10 Days.

### Estimated Resources Required to Plan the Work

*In the following table, for each appropriate labor type enter the # of Persons involved in planning the activity, the # of Days (full or partial) they will be involved, and the total # of person-Hours necessary to plan the work, e.g., 2/5/36*

| Labor Type | Code | Persons/Days/Hours |
|---|---|---|
| Manager/Senior Staff | HBB | |
| Technical Advisors | HBTA | 1/10/10 |
| Project Manager/HP Manager | HBPM | 2/10/40 |
| Task Leader | HBTL | 1/10/20 |
| Secretary/Clerical | HBS | 1/10/10 |
| Support Professional | HBP | |
| Bartlett Health Physics | HRH | 1/5/5 |
| | | |
| | | |

**Estimated Time to Perform the Work:** 51 days

**Estimated Resources Required to Perform the Work**

| Labor Type | Code | Persons/Days/Hours | PPE/Laundry Group | Total Jumps |
|---|---|---|---|---|
| Program Manager | HBA | | | |
| Manager/Senior Staff | HBB | | | |
| Technical Advisors | HBTA | 1 / 51 / 51 | | |
| Project Manager/HP Manager | HBPM | 2 / 51 / 204 | | |
| Task Leader | HBTL | 1 / 51 / 408 | Group 1 | 102 |
| Battelle Technician | HBT | 1 / 51 /51 | Group 1 | |
| Battelle Technician O/T | HBTO | | | |
| RAL Staff | HBL | | | |
| Support Professional | HBP | | | |
| Secretary/Clerical | HBS | | | |
| Decon Ops Hourly | HBH | | | |
| BCO Support | HBCO | | | |
| BCO Skilled Laborer | HCE | 1 / 16 / 32 | Group 1 | 16 |
| BCO Skilled Laborer O/T | HCEO | | | |
| BCO Facility Manager | HCF | | | |
| | | | | |
| Bartlett Technician | HRD | 4 / 51 / 1632 | Group 1 | 408 |
| Bartlett Maint Specialist | HRDS | 1 / 51 / 104 | Group 1 | 102 |
| Bartlett Health Physics | HRH | 2 / 51 / 612 | Group 1 | 102 |
| Bartlett Admin Support | HRA | | | |
| | | | | |

**Subcontract/Purchased Service:**

**Special Equipment/Material:** 50' Scissors lift for 15 days -$2,327

**Comments/Explanations:**

**Basis of Estimate:**

**What is the estimator's experience?** Twenty-five years of nuclear submarine operations and repair. Planning, nuclear quality assurance, and nuclear repair planning.
**What experience is directly related to BCLDP?** Nine years of training, and one and

half years of project management in JN-3.
**Did we apply a complexity factor during our thought process?** No complexity factor applied to this estimate

**Completed by:** C. A. Brenner/D. Seifert **Date:** 5/2/02 **Rev. No.:** 2

☐JN-1 ☒ JN-2 ☐ JN-3 ☐ Ext. Area ☐ Env. Monit. ☐ Sample Analysis ☐ Waste Mgmt

**Activity No.:** D020 **Work Pkg. No.:** 7D2-B02

**Function Name:** Survey and Monitor 1st Floor

**Component Name:** JN-2 First Floor

**Function Description:** Baseline Characterization of the 1st Floor of JN-2

## Basis of Estimate

**Strategy for Accomplishing Function:** Perform Baseline Characterization consistent with NUREG 5849

**Applicable Requirements/Procedures/Work Instructions:**

NUREG 5849 "Manual for Conducting Radiological Surveys in Support of License Termination"; Characterization & Final Status Survey Plan for the West Jefferson North Site; DD-CP-002, 004, 010, & 030; DD-90-02; DD-93-04; DD-97-02; HP-AP-1.0, 2.0, 5.0, 8.0, 9.0, & 19.0; HP-OP-011, 012, 017, 018, & 019; HS-AP-4.0 & 5.0; HS-OP-001; MA-AP-20.1; PR-AP-17.1; QD-AP-5.2 & 6.1; RL-AP-1.0; SIH-PP-06; SM-OP-001; TD-AP-2.0 & 3.0

**Input Descriptions:**

1. 1st Floor Rooms and Areas that have undergone material and M&E removal
2. Approved Work Instruction.

**Output Descriptions:**

1. Establish Building Material Radiological Background
2. Material Descision Level Values Established
3. 600 Smears to lab; gross alpha/beta
4. 16 sediment & solid samples to lab; gamma spec
5. data to report generation
6. 2 alpha isotopic samples.

**Assumptions:**

Establish Building Material Background & Decision Level Values :

1. 3 additional types of materials are present
2. (40) 1 minute measurements for alpha & beta widow per reading
3. (40) 1 minute measurements for alpha window per reading
4. 3 minute prep/setup/taking of floor readings (60%) = 4 hr
5. 5 minute prep/setup/taking of wall readings (20%) = 6.67 hr
6. 10 minute prep/setup/taking of lift readings (20%) = 13.33 hr
7. 1.25 hr to establish DLV for each material spreadsheet = 3.75 hr
8. No significant downtime; 1 d to perform

Surveys :

1. 100% of all floor area will be surveyed.
2. 100% of all wall area up to 2m will be surveyed.
3. 120% of all ceilings will be surveyed ( 20% added for horizontal surfaces)
4. 10%or 30sq. meters whichever is larger of wall areas greater than 2m will be monitored
5. Normal rate for characterization surveys is 6 square meters per technician-hour
6. Ladder rate for characterization surveys is 5 square meters per technician-hour
7. Lift rate for characterization surveys is 4 square meters per technician-hour
8. The rate for characterization surveys includes:5cm/sec survey rate/ documentation/ assess elevated levels>DLV, alpha, alpha + beta 2 min counts required, perform smears
9. 2 drains/hr; 16 samples total
10. Room & Area Volumes were taken from the REV3 Baseline waste volume inventory.
11. High Bay Dimensions 38'x21'x48'

12. WI / Instrument Calibration / Lift Rental under D006
13. No Significant Down Time

Data Technician:
1. Technician inputs 3 data values for each grid into spreadsheet
2. Technician performs QA/QC for the data input and data sheets
3. Technician identifies grids above release criteria & above background.
4. Floor 1 estimate to have 1750 grids---1100 smear results

**Estimated Time to Plan the Work (Including Review and Approval):** 0 days; WI under D006

**Estimated Resources Required to Plan the Work**

*In the following table, for each appropriate labor type enter the # of Persons involved in planning the activity, the # of Days (full or partial) they will be involved, and the total # of person-Hours necessary to plan the work, e.g., 2/5/36*

| Labor Type | Code | Persons/Days/Hours |
|---|---|---|
| Manager/Senior Staff | HBB | NA |
| Technical Advisors | HBTA | NA |
| Project Manager/HP Manager | HBPM | NA |
| Task Leader | HBTL | NA |
| Secretary/Clerical | HBS | NA |
| Support Professional | HBP | NA |
| Bartlett Health Physics | HRH | NA |
| | | |
| | | |

**Estimated Time to Perform the Work:** 13 work days for survey & sampling

**Estimated Resources Required to Perform the Work**

*In the following table, for each appropriate labor type enter the # of Persons working on the activity, the # of Days (full or partial) they are involved, and the total # of Hours necessary to actually perform the work; the PPE/Laundry Group to be used during the performance of the work; and the Total # of Jumps; e.g., 4/20/640 Group 1 160*

| Labor Type | Code | Persons/Days/Hours | PPE / Laundry Group | Total Jumps |
|---|---|---|---|---|
| Program Manager | HBA | | | |
| Manager / Senior Staff | HBB | 1/13/26 | NA | NA |
| Technical Advisors (safety) | HBTA | 1/13/13 | NA | NA |
| Project Manager / HP Manager | HBPM | | | |
| Task Leader | HBTL | 1/13/52 | 0 | 13 |
| Battelle Technician (HP) | HBT | 1/13/104 | 0 | 13 |
| Battelle Technician O/T | HBTO | | | |
| RAL Staff | HBL | | | |
| Support Professional | HBP | | | |
| Secretary / Clerical | HBS | | | |
| Decon Ops Hourly | HBH | | | |
| BCO Support | HBCO | | | |
| BCO Skilled Laborer | HCE | | | |
| BCO Skilled Laborer O/T | HCEO | | | |
| BCO Facility Manager | HCF | | | |
| | | | | |
| Bartlett Technician | HRD | | | |
| Bartlett Maint Specialist | HRDS | | | |
| Bartlett Health Physics<br>(Instruments) | HRH | 3/13/312<br>1/13/11 | 0<br>NA | 39<br>NA |

| | | | | |
|---|---|---|---|---|
| (Data) | | 1/13/104 | NA | NA |
| Bartlett Admin Support | HRA | | | |
| | | | | |

**Subcontract/Purchased Service:** None identified

**Special Equipment/Material:** 13 days of 80 foot aerial lift = $4,125

**Comments/Explanations:**

**Basis of Estimate**
**What is the estimator's experience?**
15 years of health physics and radiological release program management

**What experience is directly applicable to BCLDP?**
10 years of BCLDP characterization & radiological release program experience; 2 years at West Jefferson

**Was a complexity factor applied?**
Work is similar to KA-2 & KA-3 and no complexity factors were assumed

**Completed by:** J.F. POLIZIANI **Date:** 5/07/01 **Rev. No:** 2

☐JN-1 ☒ JN-2 ☐ JN-3 ☐ Ext. Area ☐ Env. Monit. ☐ Sample Analysis ☐ Waste Mgmt

**Activity No.:** D026 **Work Pkg. No.:** 7D4-B08

**Function Name:** Decontaminate 1st Floor Surfaces

**Component Name:** First Floor of JN-2

**Function Description:** Assemble material resources & work crews and decontaminate designated surfaces according to work instruction.

## Basis of Estimate

**Strategy for Accomplishing Function:** Brief work crews on scope of activities, procedures, radiological & safety concerns and requirements. Assemble materials, equipment and supplies; institute radiological and engineering controls & perform decontamination activities encompassing washing/wiping and scabbling of surfaces with Characterization support to monitor progress and determine completion.

### Applicable Requirements/Procedures/Work Instructions:

DD-90-02; DD-93-02 & 04; DD-CP-004 & 030; DD-OP-029, 065, 075, 077, 195, & 215; HP-AP-1.0, 2.0, 5.0, 8.0, 9.0, 11.0, 15.0, & 19.0; HP-OP-011, 012, 017, 018, 019, 023; HS-AP-2.0, 4.0, & 5.0; HS-OP-001 MA-AP-20.1; PR-AP-17.1; QD-AP-5.2 & 6.1; RL-AP-1.0; SIH-PP-06; SM-OP-001; TD-AP-2.0 & 3.0; WA-OP-020

### Input Descriptions:

1. Demarcated first floor and high bay building surfaces for decontamination (220 sq ft floors, 280 sq ft walls)
2. Characterization data
3. Decon equipment: Hilti guns, HEPA Vacs, portable enclosures, waste containers.
4. Approved Work Instruction.

### Output Descriptions:

1. First floor surfaces minus contamination
2. Completion survey data
3. Completed Work Instruction data package
4. Containerized LLW:
   - Concrete rubble & HEPA filters – 22 cu ft
   - Job control waste (compactable) – 180 cu ft
5. 12 CAM samples

### Assumptions:

1. Building surface contamination is 4% of floors and 2% of walls (500 sq ft total) distributed among 8 areas.
2. Contamination can be removed using Group 1 PPE by employing hooded HEPA enclosures at point of contact.
3. Surfaces can be scabbled to a depth of ¼ inch using Hilti guns at a rate of 25 sq ft per crew day.
4. Planning will be accomplished in D025.

**Estimated Time to Plan the Work (Including Review and Approval):** 10 days

**Estimated Resources Required to Plan the Work**

| Labor Type | Code | Persons/Days/Hours |
|---|---|---|
| Manager/Senior Staff | HBB | |
| Technical Advisors | HBTA | 1 / 10 / 5 |
| Project Manager/HP Manager | HBPM | 2 / 10 / 20 |
| Task Leader | HBTL | 1 / 10 / 10 |
| Secretary/Clerical | HBS | 1 / 10 / 5 |
| Support Professional | HBP | |
| Bartlett Health Physics | HRH | 1 / 5 / 5 |
| | | |
| | | |

**Estimated Time to Perform the Work:** 22 days

**Estimated Resources Required to Perform the Work**

| Labor Type | Code | Persons/Days/Hours | PPE/Laundry Group | Total Jumps |
|---|---|---|---|---|
| Program Manager | HBA | | | |
| Manager/Senior Staff | HBB | | | |
| Technical Advisors | HBTA | 1 / 22 / 22 | | |
| Project Manager/HP Manager | HBPM | 2 / 22 / 88 | | |
| Task Leader | HBTL | 1 / 22 / 176 | Group 1 | 22 |
| Battelle Technician | HBT | 1 / 22 / 22 | | |
| Battelle Technician O/T | HBTO | | | |
| RAL Staff | HBL | | | |
| Support Professional | HBP | | | |
| Secretary/Clerical | HBS | | | |
| Decon Ops Hourly | HBH | | | |
| BCO Support | HBCO | | | |
| BCO Skilled Laborer | HCE | 1 / 8 / 16 | Group 1 | 8 |
| BCO Skilled Laborer O/T | HCEO | | | |
| BCO Facility Manager | HCF | | | |
| | | | | |
| Bartlett Technician | HRD | 5 / 22 / 880 | Group 1 | 220 |
| Bartlett Maint Specialist | HRDS | 1 / 22 / 24 | Group 1 | 22 |
| Bartlett Health Physics | HRH | 2 / 22 / 352 | Group 1 | 88 |
| Bartlett Admin Support | HRA | | | |
| | | | | |

**Subcontract/Purchased Service:** N/A

**Special Equipment/Material:** 50 ft Scissor lift for 2days = $846.

**Comments/Explanations:**

**Basis of Estimate:**

**What is the estimator's experience?** Twenty-five years of nuclear submarine operations and repair. Planning, nuclear quality assurance, and nuclear repair planning.

**What experience is directly related to BCLDP?** Nine years of training, and two and a half years of project management in JN-3.

**Did we apply a complexity factor during our thought process?** No complexity factor applied to this estimate

**Completed by:** C. A. Brenner **Date:** 04/29/02 **Rev. No.:** 3

☐ JN-1 ☒ JN-2 ☐ JN-3 ☐ Ext. Area ☐ Env. Monit. ☐ Sample Analysis ☐ Waste Mgmt

**Activity No.:** D027 **Work Pkg. No.:** 7D4-B08

**Function Name:** Remove underground drains

**Component Name:** JN-2 First Floor

**Function Description:** Excavate and remove underground drains within the building footprint.

## Basis of Estimate

**Strategy for Accomplishing Function:** After surface decontamination is complete, mark locations of underground drain lines within the building. Engage concrete cutting contractor and excavator operator to remove floor and excavate soil above drain lines. Excavate and remove drain lines and deliver to Waste Management for processing.

**Applicable Requirements/Procedures/Work Instructions:**

DD-90-02; DD-93-04 & 05; DD-OP-029 & 090; HP-AP-1.0, 2.0, 5.0, 8.0, 9.0, & 29.0; HP-OP-012 & 017; HS-AP-2.0, 4.0, & 5.0; HS-OP-001; MA-AP-20.1; PR-AP-17.1; QD-AP-4.1, 5.2, 6.1, & 7.1; SIH-PP-06 & 08; TD-AP-2.0 & 3.0

**Input Descriptions:**

1. Building JN-2 after surface decontamination complete
2. Approved WI, RWP, Safety & WM Checklists
3. 400 ft of buried VCP drain piping.

**Output Descriptions:**

Building JN-2 with drain lines removed
Completed work instruction data package
Containerized drain removal waste:

| | | | |
|---|---|---|---|
| Excavated piping | 400 lin ft | Excavated suspect soil | 1200 cu ft |
| Excavated clean soil | 3600 cu ft | Concrete floor blocks | 1075 cu ft |
| Cutting water & sludge | 16 cu ft | Job control waste | 215 cu ft |
| Soil samples: | 100 gamma spec/ 10 alpha isotopic | Mixed waste | 6 cu ft |

**Assumptions:**

1. Underground drains are contaminated with Hg, RCRA material, and/or Rad.
2. Average depth of drains is 3 ft below bottom of 8-in thick concrete slab.
3. Leakage/breakage of pipes as excavated is 15%.
4. Concrete cutting rate is 50 lin ft per hr, soil excavation rate is 8 bags (cu yds) per day to allow for sampling.

**Estimated Time to Plan the Work (Including Review and Approval):** 15 days including acquisition of contracted services.

### Estimated Resources Required to Plan the Work

*In the following table, for each appropriate labor type enter the # of Persons involved in planning the activity, the # of Days (full or partial) they will be involved, and the total # of person-Hours necessary to plan the work, e.g., 2/5/36*

| Labor Type | Code | Persons/Days/Hours |
|---|---|---|
| Manager/Senior Staff | HBB | 1 / 1 / 4* |
| Technical Advisors | HBTA | 1 / 10 / 10 |
| Project Manager/HP Manager | HBPM | 1 / 10 / 40 1 / 1 / 4* |
| Task Leader | HBTL | 1 / 10 / 20 |
| Secretary/Clerical | HBS | 1 / 5 / 5 |
| Support Professional | HBP | |
| Bartlett Health Physics | HRH | 1 / 5 / 5 |
| | | |
| | | |

* Additional review time for Level 2 hazard rating.

**Estimated Time to Perform the Work:** 26 days

**Estimated Resources Required to Perform the Work**

*In the following table, for each appropriate labor type enter the # of Persons working on the activity, the # of Days (full or partial) they are involved, and the total # of Hours necessary to actually perform the work; the PPE/Laundry Group to be used during the performance of the work; and the Total # of Jumps; e.g., 4/20/640* *Group 1* *160*

| Labor Type | Code | Persons/Days/Hours | PPE/Laundry Group | Total Jumps |
|---|---|---|---|---|
| Program Manager | HBA | | | |
| Manager/Senior Staff | HBB | | | |
| Technical Advisors | HBTA | 1 / 26 / 26 | | |
| Project Manager/HP Manager | HBPM | 2 / 26 / 104 | | |
| Task Leader | HBTL | 1 / 26 / 208 | Group 0 | 26 |
| Battelle Technician | HBT | 1 / 26 / 26 | | |
| Battelle Technician O/T | HBTO | | | |
| RAL Staff | HBL | | | |
| Support Professional | HBP | | | |
| Secretary/Clerical | HBS | | | |
| Decon Ops Hourly | HBH | | | |
| BCO Support | HBCO | | | |
| BCO Skilled Laborer | HCE | 1 / 13 / 26 | Group 0 | 13 |
| BCO Skilled Laborer O/T | HCEO | | | |
| BCO Facility Manager | HCF | | | |
| | | | | |
| Bartlett Technician | HRD | 4 / 26./ 832 | Group 1 | 208 |
| Bartlett Maint Specialist | HRDS | 1 / 26 / 26 | Group 1 | 26 |
| Bartlett Health Physics | HRH | 3 / 26 / 624 | Group 1 | 156 |
| Bartlett Admin Support | HRA | | | |
| | | | | |

**Subcontract/Purchased Service:**

1. Concrete cutting 2024 linear ft of 8" slab - @ $7.93/ft = $16,050
2. Soil excavation: 22 days operator (176 hrs) = $8,376
3. 26 days TB015 Excavator/Backhoe = $2,866

**Special Equipment/Material:** N/A

**Comments/Explanations:** N/A

**Basis of Estimate:**

**What is the estimator's experience?** Twenty-five years of nuclear submarine operations and repair. Planning, nuclear quality assurance, and nuclear repair planning.

**What experience is directly related to BCLDP?** Nine years of training, and one and half years of project management in JN-3.

**Did we apply a complexity factor during our thought process?** No complexity factor applied to this estimate

**Completed by:** C.A. Brenner/D Seifert **Date:** 5/6/02 **Rev. No.:** 2

☐JN-1 ☒ JN-2 ☐ JN-3 ☐ Ext. Area ☐ Env. Monit. ☐ Sample Analysis ☐ Waste Mgmt

**Activity No.:** D028 **Work Pkg. No.:** 7D4-B09

**Function Name:** Perform 1st Floor Decon Completion Survey

**Component Name:** JN-2 First Floor

**Function Description:** Baseline Characterization of the 1st Floor of JN-2

## Basis of Estimate

**Strategy for Accomplishing Function:** Perform Baseline Characterization consistent with NUREG 5849

**Applicable Requirements/Procedures/Work Instructions:**

NUREG 5849 "Manual for Conducting Radiological Surveys in Support of License Termination"; Characterization & Final Status Survey Plan for the West Jefferson North Site; DD-CP-002, 004, 010, & 030; DD-93-04; DD-97-02; HS-AP-2.0, 4.0, & 5.0; HS-OP-001; MA-AP-20.1; PR-AP-17.1; QD-AP-5.2 & 6.1; RL-AP-1.0; SIH-PP-06; SM-OP-001; TD-AP-2.0

**Input Descriptions:**

1. 1st Floor Rooms and Areas that have undergone material removal, M&E removal, and decon.
2. Approved Work Instruction.

**Output Descriptions:**

1. 30 Smears to lab; gross alpha/beta
2. 16 sediment & solid samples to lab; gamma spec
3. Data to report generation
4. 2 alpha isotopic samples
5. 400 linear ft of piping to remove 122m; 48 samples per d; 122 samples (gamma spec), 12 alpha isotopic

**Assumptions:**

1. 5% of all monitored areas were found contaminated
2. 100% of all floor area were surveyed
3. 100% of all wall area up to 2m were surveyed
4. 120% of all ceilings were surveyed ( 20% added for horizontal surfaces)
5. 10%or 30sq. meters whichever is larger of wall areas greater than 2m were monitored
6. Normal rate for characterization surveys is 6 square meters per technician-hour
7. Ladder rate for characterization surveys is 5 square meters per technician-hour
8. Lift rate for characterization surveys is 4 square meters per technician-hour
9. The rate for characterization surveys includes:
   - 5cm/sec survey rate
   - documentation
   - assess elevated levels>DLV,
   - alpha, alpha + beta 2 min counts required,
   - perform smears
   - 2 drains/hr; 16 samples total
10. Room & Area Volumes were taken from the REV3 Baseline waste volume inventory
11. High Bay Dimensions 38'x21'x48'
12. WI / Instrument Calibration / Lift Rental under D014
13. No significant down time

**Estimated Time to Plan the Work (Including Review and Approval):** 0 days; WI under D006

**Estimated Resources Required to Plan the Work**

*In the following table, for each appropriate labor type enter the # of Persons involved in planning the activity, the # of Days (full or partial) they will be involved, and the total # of person-Hours necessary to plan the work, e.g., 2/5/36*

| Labor Type | Code | Persons/Days/Hours |
|---|---|---|
| Manager/Senior Staff | HBB | NA |
| Technical Advisors | HBTA | NA |
| Project Manager/HP Manager | HBPM | NA |
| Task Leader | HBTL | NA |
| Secretary/Clerical | HBS | NA |
| Support Professional | HBP | NA |
| Bartlett Health Physics | HRH | NA |

**Estimated Time to Perform the Work:** 4 days; 1 work days for decon survey; 3 work days soil sampling

**Estimated Resources Required to Perform the Work**

| Labor Type | Code | Persons/Days/Hours | PPE / Laundry Group | Total Jumps |
|---|---|---|---|---|
| Program Manager | HBA | | | |
| Manager / Senior Staff | HBB | 1/4/8 | NA | NA |
| Technical Advisors (Safety) | HBTA | 1/4/4 | NA | NA |
| Project Manager / HP Manager | HBPM | | | |
| Task Leader | HBTL | 1/4/16 | 0 | 4 |
| Battelle Technician (HP) | HBT | 1/4/32 | 0 | 4 |
| Battelle Technician O/T | HBTO | | | |
| RAL Staff | HBL | | | |
| Support Professional | HBP | | | |
| Secretary / Clerical | HBS | | | |
| Decon Ops Hourly | HBH | | | |
| BCO Support | HBCO | | | |
| BCO Skilled Laborer | HCE | | | |
| BCO Skilled Laborer O/T | HCEO | | | |
| BCO Facility Manager | HCF | | | |
| | | | | |
| Bartlett Technician | HRD | | | |
| Bartlett Maint Specialist | HRDS | | | |
| Bartlett Health Physics<br>(Instruments)<br>(Data) | HRH | 3/4/96<br>1/4/3<br>1/4/32 | 0<br>NA<br>NA | 12<br>NA<br>NA |
| Bartlett Admin Support | HRA | | | |
| | | | | |

**Subcontract/Purchased Service:** None identified

**Special Equipment/Material:** 4 days of 80 foot aerial lift = $1,428

**Comments/Explanations: Basis of Estimate**

**What is the estimator's experience?**

15 years of health physics and radiological release program management

**What experience is directly related to the BCLDP?**
10 years of BCLDP characterization & radiological release program experience

**Was a complexity factor used?**
Work was similar to KA-2 & KA-3 and a complexity factor was not used.

**Completed by:** J.F. POLIZIANI **Date:** 5/08/01 **Rev. No. : 2**

☐JN-1 ☒ JN-2 ☐ JN-3 ☐ Ext. Area ☐ Env. Monit. ☐ Sample Analysis ☐ Waste Mgmt

**Activity No.:** D031 **Work Pkg. No.:** 7D4-B07

**Function Name:** Remove 1st floor boiler and utilities

**Component Name:** JN-2 Boiler Room

**Function Description:** Dismantle & remove boiler, plumbing & electrical systems to expose building surfaces for characterization, decontamination and final demolition.

## Basis of Estimate

**Strategy for Accomplishing Function:** Dismantle & remove boiler, ductwork, plumbing & electrical systems to expose building surfaces for characterization, decontamination and final demolition.

**Applicable Requirements/Procedures/Work Instructions:**

BCLDP-90-2; DD-90-02; DD-93-04; DD-OP-110, 116, & 217; HP-AP-1.0, 2.0, 5.0, 8.0, & 9.0; HP-OP-011, 012, 017, & 019; HS-AP-2.0, 4.0, & 5.0; HS-OP-001; MA-AP-20.1; PR-AP-17.1; QD-AP-5.2 & 6.1 SIH-PP-04, 06, & 08; TD-AP-2.0 & 3.0; WA-OP-006 & 020

**Input Descriptions:**

Vacated boiler room (426 sq ft), approved work instruction, waste containers, installed utilities:

| | | | |
|---|---|---|---|
| Air compressor | 60 cu ft | Lamp Ballasts | 1 cu ft |
| Boiler | 420 cu ft | Fluorescent tubes | 3 cu ft |
| Ducting | 5 cu ft | Electrical | 10 cu ft |
| Lamp fixtures | 28 cu ft | Supply piping | 45 cu ft |
| Drain piping | 5 cu ft | Tanks | 180 cu ft |
| Water Heater | 12 cu ft | | |

**Output Descriptions:**

Completed WI data package, boiler room minus utilities
Containerized utility waste:

| | | | |
|---|---|---|---|
| Clean metal waste | 760 cu ft | PCB Waste | 5 cu ft |
| Pb/Hg waste | 8 cu ft | Job Control Waste | 94 cu ft |

**Assumptions:**

1. The first floor boiler room is uncontaminated.
2. All utilities will be disabled & placed in a zero energy state.
3. Production rate will be approximately 25 sq ft per day due to high density of heavy equipment.
4. Planning function will have been performed in Activity D003.

**Estimated Time to Plan the Work (Including Review and Approval):** 10 days.

### Estimated Resources Required to Plan the Work

*In the following table, for each appropriate labor type enter the # of Persons involved in planning the activity, the # of Days (full or partial) they will be involved, and the total # of person-Hours necessary to plan the work, e.g., 2/5/36*

| Labor Type | Code | Persons/Days/Hours |
|---|---|---|
| Manager/Senior Staff | HBB | 1 / 1 / 4* |
| Technical Advisors | HBTA | 1 / 10 / 10 |
| Project Manager/HP Manager | HBPM | 2 / 10 / 40 1 / 1 / 4* |
| Task Leader | HBTL | 1 / 10 / 20 |
| Secretary/Clerical | HBS | 1 / 5 / 5 |
| Support Professional | HBP | |
| Bartlett Health Physics | HRH | 1 / 5 / 5 |
| | | |
| | | |

* Additional review time for Level 2 hazard rating.

**Estimated Time to Perform the Work:** 17 days

**Estimated Resources Required to Perform the Work**

*In the following table, for each appropriate labor type enter the # of Persons working on the activity, the # of Days (full or partial) they are involved, and the total # of Hours necessary to actually perform the work; the PPE/Laundry Group to be used during the performance of the work; and the Total # of Jumps; e.g., 4/20/640 Group 1 160*

| Labor Type | Code | Persons/Days/Hours | PPE/Laundry Group | Total Jumps |
|---|---|---|---|---|
| Program Manager | HBA | | | |
| Manager/Senior Staff | HBB | | | |
| Technical Advisors | HBTA | 1 / 17 / 17 | | |
| Project Manager/HP Manager | HBPM | 2 / 17 / 68 | | |
| Task Leader | HBTL | 1 / 17 / 136 | Group 0 | 17 |
| Battelle Technician | HBT | 1 / 10 / 10 | | |
| Battelle Technician O/T | HBTO | | | |
| RAL Staff | HBL | | | |
| Support Professional | HBP | | | |
| Secretary/Clerical | HBS | | | |
| Decon Ops Hourly | HBH | | | |
| BCO Support | HBCO | | | |
| BCO Skilled Laborer | HCE | 1 / 10 / 40 | Group 0 | 8 |
| BCO Skilled Laborer O/T | HCEO | | | |
| BCO Facility Manager | HCF | | | |
| | | | | |
| Bartlett Technician | HRD | 5 / 17 / 680 | Group 0 | 85 |
| Bartlett Maint Specialist | HRDS | 1 / 10 / 40 | Group 2 | 2 |
| Bartlett Health Physics | HRH | 1 / 17 / 68 | Group 0 | 17 |
| Bartlett Admin Support | HRA | | | |
| | | | | |

**Subcontract/Purchased Service:**

**Special Equipment/Material:** N/A

**Comments/Explanations:**

**Basis of Estimate:**

**What is the estimator's experience?** Twenty-five years of nuclear submarine operations and repair. Planning, nuclear quality assurance, and nuclear repair planning.

**What experience is directly related to BCLDP?** Nine years of training, and one and half years of project management in JN-3.

**Did we apply a complexity factor during our thought process?** No complexity factor applied to this estimate

**Completed by:** C. A. Brenner/D Seifert **Date:** 05/06/02 **Rev. No.:** 2

☐ JN-1 ☒ JN-2 ☐ JN-3 ☐ Ext. Area ☐ Env. Mtr. ☐ Samples ☐ TRU/Waste ☐ Release Site

**Activity No.:** D061 **Work Pkg. No.:** 7D4-B10

**Function Name:** Remove mechanical & electrical equipment from external building surfaces

**Component Name:** JN-2 External Surfaces

**Function Description:** Dismantle and remove exhaust systems and electrical services from the building roof & walls and place temporary patches over penetrations to maintain interior integrity.

## Basis of Estimate

**Strategy for Accomplishing Function:** Generate work control documents and use to manually remove the systems from the building roof, external walls, and penthouse using appropriate tools & equipment according to approved work instruction, RWP, Safety & WM checklists.

### Applicable Requirements/Procedures:

DD-90-02; DD-93-04 & 05; DD-OP-090, 102, 110, 116, & 217; HP-AP-1.0, 2.0, & 5.0; HP-OP-017 & 019; HS-AP-2.0, 4.0, & 5.0; HS-OP-001; MA-AP-20.1; PR-AP-17.1, QD-AP-4.1, 5.2, 6.1, & 7.1; SIH-PP-04 & 06; SM-OP-001 TD-AP-2.0, & 3.0; WA-OP-020

### Input Descriptions:

1. Waste containers
2. Building JN-2 with all interior utilities & services disabled /removed.
3. Fall protection apparatus
4. Roof mounted mechanical equipment:

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| - | Heat Exchanger | | 84 cu ft | - | Large ductwork | | 48 cu ft |
| - | Transformer | | 9 cu ft | - | Outdoor lighting | | 4 cu ft |
| - | HVAC Units | 3 | 144 cu ft | - | Blower | 14 | 336 cu ft |
| - | Vent Stacks | 31 | 155 cu ft | - | Misc Items | 3 | 24 cu ft |

### Output Descriptions:

1. Building external surfaces free of mechanical/electrical equipment
2. Completed work instruction data package
3. Containerized equipment waste:

| | | | | |
|---|---|---|---|---|
| - | Clean metal waste | 795 cu ft | - | PCB waste | 9 cu ft |
| - | Pb/Hg waste (lamps) | 1 cu ft | - | Job control waste | 15 cu ft |

### Assumptions:

1. All items on JN-2 roof and in penthouse are radiologically clean.
2. Production rate is approximately 250 sq ft per day with one crew.

**Estimated Time to Plan the Work (Including Review and Approval):** 15 days including procurement of crane service.

### Estimated Resources Required to Plan the Work

*In the following table, for each appropriate labor type enter the # of Persons, Days, and Hours necessary to plan the work, e.g., 2/5/80*

| Labor Type | Code | Persons/Days/Hours |
|---|---|---|
| Manager/Senior Staff | HBB | 1 / 1 / 4* |
| Technical Advisors | HBTA | 1 / 15 / 10 |
| Project Manager/HP Manager | HBPM | 2 / 15 / 20 1 / 1 / 4* |
| Task Leader | HBTL | 1 / 10 / 10 |
| Secretary/Clerical | HBS | 1 / 5 / 5 |
| Support Professional | HBP | |
| Bartlett Health Physics | HRH | 1 / 5 / 5 |

* Additional review time for Level 2 hazard rating.

**Estimated Time to Perform the Work:** 20 days

**Estimated Resources Required to Perform the Work**

| Labor Type | Code | Persons/Days/Hours | PPE/Laundry Group | Total Jumps |
|---|---|---|---|---|
| Program Manager | HBA | | | |
| Manager/Senior Staff | HBB | | | |
| Technical Advisors | HBTA | 1 / 20 / 20 | | |
| Project Manager/HP Manager | HBPM | 2 / 20 / 80 | | |
| Task Leader | HBTL | 1 / 20 / 160 | Group 0 | 20 |
| Battelle Technician | HBT | 1 / 20 / 20 | | |
| Battelle Technician O/T | HBTO | | | |
| RAL Staff | HBL | | | |
| Support Professional | HBP | | | |
| Secretary/Clerical | HBS | | | |
| Decon Ops Hourly | HBH | | | |
| BCO Support | HBCO | | | |
| BCO Skilled Laborer | HCE | 1 / 4 / 8 | Group 0 | 4 |
| BCO Skilled Laborer O/T | HCEO | | | |
| BCO Facility Manager | HCF | | | |
| | | | | |
| Bartlett Technician | HRD | 4 / 20 / 640 | Group 0 | 80 |
| Bartlett Maint Specialist | HRDS | 1 / 10 / 20 | | |
| Bartlett Health Physics | HRH | 2 / 20 / 120 | Group 0 | 30 |
| Bartlett Admin Support | HRA | | | |
| | | | | |

**Subcontract/Purchased Service:** 25 ton telescoping boom crane and operator for 4 days @ 132.19/hour x 32 hours = $4,230.

**Special Equipment/Material:**

**Comments/Explanations:**

**Basis of Estimate:**

**What is the estimator's experience?** Twenty-five years of nuclear submarine operations and repair. Planning, nuclear quality assurance, and nuclear repair planning.

**What experience is directly related to BCLDP?** Nine years of training, and one and half years of project management in JN-3.

**Did we apply a complexity factor during our thought process?** No complexity factor applied to this estimate

**Completed by:** C. A. Brenner/D Seifert **Date:** 5/6/02 **Rev. No.** 2

☐JN-1 ☒ JN-2 ☐ JN-3 ☐ Ext. Area ☐ Env. Monit. ☐ Sample Analysis ☐ Waste Mgmt

**Activity No.:** D063 **Work Pkg. No.:** 7D2-B03

**Function Name:** Survey and Monitor External Building Surfaces (Including Roof)

**Component Name:** JN-2 External Building Surfaces & Roof

**Function Description:** Baseline Characterization of the JN-2 External Building Surfaces

## Basis of Estimate

**Strategy for Accomplishing Function:** Perform Baseline Characterization consistent with NUREG 5849

**Applicable Requirements/Procedures/Work Instructions:**

NUREG 5849 "Manual for Conducting Radiological Surveys in Support of License Termination"; Characterization & Final Status Survey Plan for the West Jefferson North Site; DD-90-02; DD-93-04; DD-97-02; DD-CP-002, 004, 010, & 030; HP-AP-1.0, 2.0, 5.0, 8.0, 9.0, & 19.0; HP-OP-011, 012, 017, 018, & 019; HS-AP-2.0, 4.0, & 5.0; HS-OP-001; MA-AP-20.1; PR-AP-17.1; QD-AP-5.2 & 6.1; RL-AP-1.0; SIH-PP-06; SM-OP-001; TD-AP-2.0 & 3.0

**Input Descriptions:** External Building Surfaces that have undergone material and M&E removal
Approved Work Instruction

**Output Descriptions:**

1. Building Material Radiological Background Established
2. Derivation of Decision Level Values (DLV) for Characterization Surveys
3. 50 smears to lab; gross alpha/beta
4. Sediment & solid samples to lab; 10 gamma specs, 1 alpha isotopic
5. Data to report generation

**Assumptions:**

Establish Radiological Background of Materials and Survey Decision Level Values (DLV):
6 types of materials are present
(40) 1 minute measurements for alpha & beta window per material
(40) 1 minute measurements for alpha window per material
3 minute prep/setup/taking floor readings (60%) = 8 hr
5 minute prep/setup/taking wall readings (20%) = 13.33 hr
10 minute prep/setup/taking lift readings (20 %) = 26.67 hr
1.25 hr to establish DLV for each material = 8 hr
No significant downtime

External Surfaces:
10% or 30 square meters whichever is larger of each external wall will be monitored
Normal rate for characterization surveys is 6 square meters per technician-hour
Ladder rate for characterization surveys is 5 square meters per technician-hour
Lift rate for characterization surveys is 4 square meters per technician-hour
The rate for characterization surveys includes : (See D006)
Room & Area Volumes were taken from the REV3 Baseline waste volume inventory.
Building Dimensions 90'x90'x30'
High Bay Dimensions 38'x21'x48'

Penthouse Dimensions 22'x19'x48'
WI / Instrument Calibration / Lift Rental under D006
No significant downtime; 2 d to perform

Roof :
10% or 30 square meters whichever is larger of the roof area will be monitored.
An additional 10% of the roof area shall be included for monitoring blower/ducts etc.
Roof rate for characterization survey is 5 square meters per technician-hour

Data Technician;
Technician inputs 3 data values for each grid into spreadsheet
Technician also performs QA/QC for the data input & data sheets
Technician identifies grids above release criteria & background
External Walls and Roof Estimated to have 150 grids

**Estimated Time to Plan the Work (Including Review and Approval):** 0 days: WI under D006

**Estimated Resources Required to Plan the Work**

| Labor Type | Code | Persons/Days/Hours |
|---|---|---|
| Manager/Senior Staff | HBB | NA |
| Technical Advisors | HBTA | NA |
| Project Manager/HP Manager | HBPM | NA |
| Task Leader | HBTL | NA |
| Secretary/Clerical | HBS | NA |
| Support Professional | HBP | NA |
| Bartlett Health Physics | HRH | NA |
| | | |

**Estimated Time to Perform the Work:** 6 work days for survey

**Estimated Resources Required to Perform the Work**

| Labor Type | Code | Persons/Days/Hours | PPE / Laundry Group | Total Jumps |
|---|---|---|---|---|
| Program Manager | HBA | | | |
| Manager / Senior Staff | HBB | 1/6/12 | NA | NA |
| Technical Advisors | HBTA | | | |
| Project Manager / HP Manager | HBPM | 1/6/6 | NA | NA |
| Task Leader. | HBTL | 1/6/24 | 0 | 6 |
| Battelle Technician | HBT | 1/6/48 | 0 | 6 |
| Battelle Technician O/T | HBTO | | | |
| RAL Staff | HBL | | | |
| Support Professional | HBP | | | |
| Secretary / Clerical | HBS | | | |
| Decon Ops Hourly | HBH | | | |
| BCO Support | HBCO | | | |
| BCO Skilled Laborer | HCE | | | |
| BCO Skilled Laborer O/T | HCEO | | | |
| BCO Facility Manager | HCF | | | |
| | | | | |
| Bartlett Technician | HRD | | | |

| | | | | |
|---|---|---|---|---|
| Bartlett Maint Specialist | HRDS | | | |
| Bartlett Health Physics<br>(Instruments)<br>(Data) | HRH | 3/6/144<br>1/6/5<br>1/6/48 | 0<br>NA<br>NA | 18<br>NA<br>NA |
| Bartlett Admin Support | HRA | | | |
| | | | | |

**Subcontract/Purchased Service:** None identified

**Special Equipment/Material:** 6 days of 80 foot aerial lift = $2,274

**Comments/Explanations:**

**Basis of Estimate**

**What is the estimator's experience?**
15 years of health physics and radiological release program management

**What experience is directly related to BCLDP?**
10 years of BCLDP characterization & radiological releases program experience; 2 years at West Jefferson

**Was a complexity factor used?**
Work is similar to KA-2 & KA-3 buildings and no complexity factor was assumed

**Completed by:** J.F. POLIZIANI **Date:** 5/08/01 **Rev. No:** 2

☐ JN-1 ☒ JN-2 ☐ JN-3 ☐ Ext. Area ☐ Env. Monit. ☐ Sample Analysis ☐ Waste Mgmt

**Activity Number:** D067 **Work Package:** 7D2-B04

**Activity Name:** Prepare JN-2 Characterization & Final Status Report

**Component Name:** JN-2 Building

**Function Description:** Characterization Report of Building JN-2

## Basis of Estimate

**Strategy for Accomplishing Function:** Perform Baseline Characterization consistent with NUREG 5849

**Applicable Requirements/Procedures/Work Instructions:**

1. NUREG 5849 "Manual for Conducting Radiological Surveys in Support of License Termination"
2. Characterization & Final Status Survey Plan for the West Jefferson North Site March 2000
3. DD-CP-004 "Radioactive Contamination Monitoring Requirements for Facility Surface Characterization"
4. DD-CP-002 "Facility Post-Decontamination Final Status Survey for Baseline Areas"

**Input Descriptions:**

Characterization:

1. Completed Data Sheets form Characterization Field Work
2. 1184 grids with 3 data values for each grid
3. 800 smear results from laboratory (2 data values/smear).

Final Status:

1. Completed Data Sheets from Final Status Survey
2. 50% of grids covered during final status with 3 data values each
3. 480 final status smears taken

**Output Descriptions:**

1. Characterization & Final Status Report for Building JN-2.

**Assumptions:**

1. Data Reduction & Report Generation will take 20 working-d post field activities
2. Review & Comment Resolution will take 15 working-d in schedule
3. Report Schedule will take 40 working-d total.
4. Map production will take 10d of labor
5. 6 professionals will take 8 hrs each to review/comment/resolve comments
6. 5 d of technician time is necessary to resolve/incorporate comments
7. Room & Area Volumes were taken from the REV3 Baseline waste volume inventory.
8. IVC/NRC approval review necessary for Building Characterization/Final Status Report
9. Only one Building Report will be produced

**Estimated Time to Plan the Work (Including Review and Approval):** 0 days

## Estimated Resources Required to Plan the Work

*In the following table, for each appropriate labor type enter the # of Persons involved in planning the activity, the # of Days (full or partial) they will be involved, and the total # of person-Hours necessary to plan the work, e.g., 2/5/36*

| Labor Type | Code | Persons/Days/Hours |
|---|---|---|
| Manager/Senior Staff | HBB | NA |
| Technical Advisors | HBTA | NA |
| Project Manager/HP Manager | HBPM | NA |
| Task Leader | HBTL | NA |
| Secretary/Clerical | HBS | NA |
| Support Professional | HBP | NA |
| Bartlett Health Physics | HRH | NA |
| | | |
| | | |

**Estimated Time to Perform the Work:** 40 working days

## Estimated Resources Required to Perform the Work

*In the following table, for each appropriate labor type enter the # of Persons working on the activity, the # of Days (full or partial) they are involved, and the total # of Hours necessary to actually perform the work; the PPE/Laundry Group to be used during the performance of the work; and the Total # of Jumps; e.g., 4/20/640 Group 1 160*

| Labor Type | Code | Persons/Days/Hours | PPE/Laundry Group | Total Jumps |
|---|---|---|---|---|
| Program Manager | HBA | | | |
| Manager/Senior Staff | HBB | 1/40/20 | NA | NA |
| Technical Advisors | HBTA | | | |
| Project Manager/HP Manager | HBPM | 6/8/48 | NA | NA |
| Task Leader | HBTL | | | |
| Battelle Technician | HBT | | | |
| Battelle Technician O/T | HBTO | | | |
| RAL Staff | HBL | | | |
| Support Professional | HBP | | | |
| Secretary/Clerical | HBS | | | |
| Decon Ops Hourly | HBH | | | |
| BCO Support | HBCO | | | |
| BCO Skilled Laborer | HCE | | | |
| BCO Skilled Laborer O/T | HCEO | | | |
| BCO Facility Manager | HCF | | | |
| | | | | |
| Bartlett Technician | HRD | | | |
| Bartlett Maint Specialist | HRDS | | | |
| Bartlett Health Physics (Maps)<br>(Data) | HRH | 1/10/80<br>1/25/200 | NA | NA |
| Bartlett Admin Support | HRA | | | |
| | | | | |

**Subcontract/Purchased Service:** None identified

**Special Equipment/Material:** None

**Comments/Explanations:** None

**Basis of Estimate**

**What is the estimator's experience?**
15 years of health physics & radiological release program management

**What experience is directly applicable to BCLDP?**
10 years of BCLDP characterization & radiological release program experience; 2 years At West Jefferson

**Was a complexity factor used?**
No, work similar to that experienced at KA

**Completed by:** J.F. POLIZIANI **Date:** 5/30/01 **Rev. No.:** 2

☒ JN-2 ☐ JN-3 ☐ Ext. Area ☐ Env. Monit. ☐ Sample Analysis ☐ Waste Mgmt

**Activity No.:** D069 **Work Pkg. No.:** 7D4-B11

**Function Name:** Decontaminate external building surfaces

**Component Name:** JN-2 Exterior building

**Function Description:** Assemble material resources & work crews and decontaminate designated surfaces according to work instruction.

## Basis of Estimate

**Strategy for Accomplishing Function:** Brief work crews on scope of activities, procedures, radiological & safety concerns and requirements. Assemble materials, equipment and supplies; institute radiological and engineering controls & perform decontamination activities encompassing washing/wiping and scabbling of surfaces with Characterization support to monitor progress and determine completion.

### Applicable Requirements/Procedures/Work Instructions:

DD-90-02; DD-93-02, 04, & 05; DD-CP-004 & 030; DD-OP-029, 075, 077, 195, & 215; HP-AP-1.0, 2.0, 5.0, 8.0, 9.0, & 19.0; HP-OP-011, 012, 017, 019, & 023; HS-AP-2.0, 4.0, & 5.0; HS-OP-001; MA-AP-20.1; PR-AP-17.1 QD-AP-4.1, 5.2, 6.1, & 7.1; SIH-PP-06; SM-OP-001; TD-AP-2.0 & 3.0; WA-OP-020

### Input Descriptions:

1. Demarcated exterior building surfaces for decontamination (50 sq ft)
2. Characterization data
3. Decon equipment: Hilti guns, HEPA Vacs, point of contact enclosures, elevated personnel platforms, fall protection, waste containers.
4. Approved Work Instruction.

### Output Descriptions:

1. Exterior surfaces minus contamination
2. Completion survey data
3. Completed Work Instruction data package
4. Containerized LLW:
   - Concrete rubble – 2 cu ft
   - Job control waste (compatible) – 11 cu ft

### Assumptions:

1. Building surface contamination is 50 sq ft total distributed among 10 scattered areas.
2. Contamination can be removed using Group 0 PPE by employing hooded HEPA enclosures at point of contact.
3. Surfaces can be scabbled to a depth of ¼ inch using Hilti guns at a rate of two areas per crew day including location, setup, Characterization oversight and verification.
4. Planning will be accomplished in Activity D068.

**Estimated Time to Plan the Work (Including Review and Approval):** 10 days

### Estimated Resources Required to Plan the Work

*In the following table, for each appropriate labor type enter the # of Persons involved in planning the activity, the # of Days (full or partial) they will be involved, and the total # of person-Hours necessary to plan the work, e.g., 2/5/36*

| Labor Type | Code | Persons/Days/Hours |
|---|---|---|
| Manager/Senior Staff | HBB | |
| Technical Advisors | HBTA | 1 / 10 / 5 |
| Project Manager/HP Manager | HBPM | 1 / 10 / 20 |
| Task Leader | HBTL | 1 / 10 / 10 |
| Secretary/Clerical | HBS | 1 / 10 / 5 |
| Support Professional | HBP | |
| Bartlett Health Physics | HRH | 1 / 5 / 5 |
| | | |
| | | |

**Estimated Time to Perform the Work:** 5 days

## Estimated Resources Required to Perform the Work

| Labor Type | Code | Persons/Days/Hours | PPE/Laundry Group | Total Jumps |
|---|---|---|---|---|
| Program Manager | HBA | | | |
| Manager/Senior Staff | HBB | | | |
| Technical Advisors | HBTA | 1 / 5 / 5 | | |
| Project Manager/HP Manager | HBPM | 2 / 5 / 20 | | |
| Task Leader | HBTL | 1 / 5 / 40 | Group 0 | 5 |
| Battelle Technician | HBT | 1 / 5 / 5 | | |
| Battelle Technician O/T | HBTO | | | |
| RAL Staff | HBL | | | |
| Support Professional | HBP | | | |
| Secretary/Clerical | HBS | | | |
| Decon Ops Hourly | HBH | | | |
| BCO Support | HBCO | | | |
| BCO Skilled Laborer | HCE | 1 / 2 / 4 | Group 0 | 2 |
| BCO Skilled Laborer O/T | HCEO | | | |
| BCO Facility Manager | HCF | | | |
| | | | | |
| Bartlett Technician | HRD | 4 / 5 / 160 | Group 0 | 20 |
| Bartlett Maint Specialist | HRDS | 1 / 5 / 10 | Group 0 | 5 |
| Bartlett Health Physics | HRH | 2 / 5 / 80 | Group 0 | 10 |
| Bartlett Admin Support | HRA | | | |
| | | | | |

**Subcontract/Purchased Service:** N/A

**Special Equipment/Material:** 5 days of 60 ft aerial lift = $846.

**Comments/Explanations:**

**Basis of Estimate:**

**What is the estimator's experience?** Twenty-five years of nuclear submarine operations and repair. Planning, nuclear quality assurance, and nuclear repair planning.

**What experience is directly related to BCLDP?** Nine years of training, and two and a half years of project management in JN-3.

**Did we apply a complexity factor during our thought process?** No complexity factor applied to this estimate

**Completed by:** C. A. Brenner **Date:** 04/29/02 **Rev. No.:** 3

☐ JN-1 ☒ JN-2 ☐ JN-3 ☐ Ext. Area ☐ Env. Monit. ☐ Sample Analysis ☐ Waste Mgmt

**Activity No.:** D070 **Work Pkg. No.:** 7D4-B12

**Function Name:** Perform External Building Surface Decon Completion Survey

**Component Name:** JN-2 External Building Surfaces

**Function Description:** Baseline Characterization of the JN-2 External Building Surfaces

## Basis of Estimate

**Strategy for Accomplishing Function:** Perform Baseline Characterization consistent with NUREG 5849

**Applicable Requirements/Procedures/Work Instructions:**

NUREG 5849 "Manual for Conducting Radiological Surveys in Support of License Termination"; Characterization & Final Status Survey Plan for the West Jefferson North Site; DD-93-04 & 05; DD-97-02; DD-CP-002, 004, 010, & 030; HS-AP-2.0, 4.0, & 5.0; HS-OP-001; MA-AP-20.1; PR-AP-17.1; QD-AP-4.1, 5.2, 6.1, & 7.1; RL-AP-1.0; SIH-PP-06; SM-OP-001; TD-AP-2.0

**Input Descriptions:**

1. External Building Surfaces that have undergone material removal, M&E removal, and decon.
2. Approved Work Instruction.

**Output Descriptions:**

1. 10 smears to lab; gross alpha/beta
2. 1 sediment & solid sample to lab; gamma spec
3. Data to report generation

**Assumptions:**

1. 5% of External Surfaces & Roof Areas monitored are contaminated above criteria
2. 10% or 30 square meters whichever is larger of each external wall will be monitored
3. Normal rate for characterization surveys is 6 square meters per technician-hour
4. Ladder rate for characterization surveys is 5 square meters per technician-hour
5. Lift rate for characterization surveys is 4 square meters per technician-hour
6. The rate for characterization surveys includes : (See D006)
7. Room & Area Volumes were taken from the REV3 Baseline waste volume inventory.
8. Building Dimensions 90'x90'x30'
9. High Bay Dimensions 38'x21'x48'
10. Penthouse Dimensions 22'x19'x48'
11. WI / Instrument Calibration / Lift Rental under D006

**Estimated Time to Plan the Work (Including Review and Approval):** 0 days; WI under D006

## Estimated Resources Required to Plan the Work

*In the following table, for each appropriate labor type enter the # of Persons involved in planning the activity, the # of Days (full or partial) they will be involved, and the total # of person-Hours necessary to plan the work, e.g., 2/5/36*

| Labor Type | Code | Persons/Days/Hours |
|---|---|---|
| Manager/Senior Staff | HBB | NA |
| Technical Advisors | HBTA | NA |
| Project Manager/HP Manager | HBPM | NA |
| Task Leader | HBTL | NA |
| Secretary/Clerical | HBS | NA |
| Support Professional | HBP | NA |
| Bartlett Health Physics | HRH | NA |
| | | |
| | | |

**Estimated Time to Perform the Work:** 2 work days for survey

**Estimated Resources Required to Perform the Work**

*In the following table, for each appropriate labor type enter the # of Persons working on the activity, the # of Days (full or partial) they are involved, and the total # of Hours necessary to actually perform the work; the PPE/Laundry Group to be used during the performance of the work; and the Total # of Jumps; e.g., 4/20/640 Group 1 160*

| Labor Type | Code | Persons/Days/Hours | PPE / Laundry Group | Total Jumps |
|---|---|---|---|---|
| Program Manager | HBA | | | |
| Manager / Senior Staff | HBB | 1/2/4 | NA | NA |
| Technical Advisors (Safety) | HBTA | 1/2/2 | NA | NA |
| Project Manager / HP Manager | HBPM | | | |
| Task Leader. | HBTL | 1/2/8 | 0 | 2 |
| Battelle Technician (HP) | HBT | 1/2/16 | 0 | 2 |
| Battelle Technician O/T | HBTO | | | |
| RAL Staff | HBL | | | |
| Support Professional | HBP | | | |
| Secretary / Clerical | HBS | | | |
| Decon Ops Hourly | HBH | | | |
| BCO Support | HBCO | | | |
| BCO Skilled Laborer | HCE | | | |
| BCO Skilled Laborer O/T | HCEO | | | |
| BCO Facility Manager | HCF | | | |
| | | | | |
| Bartlett Technician | HRD | | | |
| Bartlett Maint Specialist | HRDS | | | |
| Bartlett Health Physics<br>(Instruments)<br>(Data) | HRH | 3/2/48<br>1/2/2<br>1/2/16 | 0<br>NA<br>NA | 6<br>NA<br>NA |
| Bartlett Admin Support | HRA | | | |
| | | | | |

**Subcontract/Purchased Service:** None identified

**Special Equipment/Material:** 2 days of 80 foot aerial lift = $846.

**Comments/Explanations:**
**Basis of Estimate :**

**What is the estimator's experience?**
15 years of health physics & radiological release program management

**What experience directly related to the BCLDP?**
10 years of BCLDP characterization & radiological release program experience; 2 years at West Jefferson

**Was a complexity factor used?**
Work was similar to King Avenue KA-2 & KA-3. No complexity factor was used.

**Completed by:** J.F. POLIZIANI **Date:** 5/08/01 **Rev. No.:** 2

☐ JN-1 ☒ JN-2 ☐ JN-3 ☐ Ext. Area ☐ Env. Mtr. ☐ Samples ☐ TRU/Waste ☐ Release Site

**Activity No.:** D071 **Work Pkg. No.:** 7D4-B13

**Function Name:** Remove NESHAPS Material

**Component Name:** JN-2 building with windows containing asbestos material

**Function Description:** Asbestos abatement subcontractor will remove and dispose of building windows intact and any other residual asbestos material. Subcontractor will be responsible for providing all materials and for disposal of all asbestos related materials and windows.

## Basis of Estimate

**Strategy for Accomplishing Function:** Procure asbestos abatement subcontractor to perform task with nominal BCLDP technical and HP support/oversight.

**Applicable Requirements/Procedures:**

Approved work instruction; Contract for asbestos abatement subcontractor; OEPA and ODOH asbestos abatement regulations; DD-93-04 & 05; HS-AP-4.0; HS-OP-001; PR-AP-17.1; QD-AP-4.1, 5.2, 6.1, & 7.1; TD-AP-2.0

**Input Descriptions:**

1. JN-2 cold and dark, ready for demolition

**Output Descriptions:**

1. JN-2 building ready for demolition less any NESHAPS material
2. All asbestos related waste to be disposed of by subcontractor
3. Asbestos release surveys, air sampling results (if required) and final disposal documents.

**Assumptions:**

1. No rad contaminated material is involved.
2. All asbestos related material to be disposed of in local approved landfill by asbestos abatement subcontractor.
3. Price quote is based on work being performed in FY 2001.

**Estimated Time to Plan the Work (Including Review and Approval):** 15 days including notification to ODOH and OEPA by asbestos abatement subcontractor.

### Estimated Resources Required to Plan the Work

*In the following table, for each appropriate labor type enter the # of FTE's, Days, and Hours necessary to plan the work, e.g., 2/5/80*

| Labor Type | Code | Persons/Days/Hours |
|---|---|---|
| Manager/Senior Staff | HBB | 1/1/4* |
| Technical Advisors | HBTA | 1/2/4 |
| Project Manager/HP Manager | HBPM | 2/10/24 1/1/4* |
| Task Leader | HBTL | 1/10/10 |
| Secretary/Clerical | HBS | 1/1/4 |
| Support Professional | HBP | 1/10/10 |
| Bartlett Health Physics | HRH | |
| Bartlett Technician | HRD | |
| | | |

* Additional review time for Level 2 hazard rating.

**Estimated Time to Perform the Work:** 10 days to remove windows

**Estimated Resources Required to Perform the Work**

*In the following table, for each appropriate labor type enter the # of Persons working on the activity, the # of Days (full or partial) they are involved, and the total # of Hours necessary to actually perform the work; the PPE/Laundry Group to be used during the performance of the work; and the Total # of Jumps; e.g., 4/20/640*
*Group 1 160*

| Labor Type | Code | Persons/Days/Hours | PPE/Laundry Group | Total Jumps |
|---|---|---|---|---|
| Program Manager | HBA | | | |
| Manager/Senior Staff | HBB | | | |
| Technical Advisors | HBTA | 1/10/10 | | |
| Project Manager/HP Manager | HBPM | 2/10/10 | N/A | |
| Task Leader | HBTL | 1/10/20 | N/A | |
| Battelle Technician | HBT | | | |
| Battelle Technician O/T | HBTO | | | |
| RAL Staff | HBL | | | |
| Support Professional | HBP | | N/A | |
| Secretary/Clerical | HBS | | | |
| Decon Ops Hourly | HBH | | | |
| BCO Support | HBCO | | | |
| BCO Skilled Laborer | HCE | | | |
| BCO Skilled Laborer O/T | HCEO | | | |
| BCO Facility Manager | HCF | | | |
| | | | | |
| Bartlett Technician | HRD | 1/10/40 | N/A | |
| Bartlett Maint Specialist | HRDS | | | |
| Bartlett Health Physics | HRH | 1/10/20 | N/A | |
| Bartlett Admin Support | HRA | | | |
| | | | | |

**Subcontract/Purchased Service:** AHC Inc. subcontractor estimate = $13,964.

**Special Equipment/Material:** Ladders and manlifts to be supplied by BCLDP. All other material to be supplied by asbestos abatement subcontractor.

**Comments/Explanations:** No rad contamination is involved. All material to be disposed of by asbestos abatement subcontractor HP required for free release and set-ups in rad areas.

**Basis of Estimate:**

**What is the estimator's experience?** Twenty-five years of nuclear submarine operations and repair. Planning, nuclear quality assurance, and nuclear repair planning.

**What experience is directly related to BCLDP?** Nine years of training, and one and half years of project management in JN-3.

**Did we apply a complexity factor during our thought process?** No complexity factor applied to this estimate

**Completed by:** C. A. Brenner/D. Seifert **Date:** 5/3/02 **Rev. No.** 2

☐ JN-1 ☒ JN-2 ☐ JN-3 ☐ Ext. Area ☐ Env. Monit. ☐ Sample Analysis ☐ Waste Mgmt

**Activity No.:** D072 **Work Pkg. No.:** 7D4-B14

**Function Name:** Demolish Surface Structure

**Component Name:** JN-2 Building

**Function Description:** Engage demolition contractor to take down building and dispose of clean rubble.

## Basis of Estimate

**Strategy for Accomplishing Function:** Demolition contractor takes down building according to industrial protocol, including floor slab, and removes rubble from site. Contractor pauses while BCLDP removes contaminated soil from below building footprint, then returns and removes column footers to a depth of 6 ft below grade and underground fuel oil storage tank. The manpower identified is the Battelle oversight effort associated with the subcontractor's work.

### Applicable Requirements/Procedures/Work Instructions:

DD-93-04 & 05; PR-AP-17.1; QD-AP-4.1 & 7.1; TD-AP-2.0

### Input Descriptions:

1. Building shell minus windows, roof flashings, mechanical systems.
2. Signed demolition contract.
3. Demolition contractor with all tools, materials, equipment needed for task.

### Output Descriptions:

| | | | |
|---|---|---|---|
| Concrete rubble above grade | 617 cu yd | Masonry rubble | 324 cu yd |
| Built up roof | 74 cu yd | Steel frame | 200 cu yd |
| Foundations | 295 cu yd | | |

### Assumptions:

1. Once work begins, each step of the operation (above grade & foundations) will be carried out by demolition contractor without BCLDP interaction beyond PM oversight.
2. Duration is 30 days for building & slab, 10 days for foundation, and 5 days for underground fuel storage tank based on budgetary estimate from commercial demolition contractor (S.G. Loewendick & Sons, 5/15/2002)

**Estimated Time to Plan the Work (Including Review and Approval):** 60 days

### Estimated Resources Required to Plan the Work

*In the following table, for each appropriate labor type enter the # of Persons involved in planning the activity, the # of Days (full or partial) they will be involved, and the total # of person-Hours necessary to plan the work, e.g., 2/5/36*

| Labor Type | Code | Persons/Days/Hours |
|---|---|---|
| Manager/Senior Staff | HBB | 2 / 2 / 8 |
| Technical Advisors | HBTA | 1 / 2 / 4 |
| Project Manager/HP Manager | HBPM | 2 / 60 / 80 |
| Task Leader | HBTL | 1 / 5 / 10 |
| Secretary/Clerical | HBS | 1 / 2 / 16 |
| Support Professional | HBP | |
| Bartlett Health Physics | HRH | |
| | | |
| | | |

**Estimated Time to Perform the Work:** 55 days including wait interval for contaminated soil removal per activity D080

**Estimated Resources Required to Perform the Work**

*In the following table, for each appropriate labor type enter the # of Persons working on the activity, the # of Days (full or partial) they are involved, and the total # of Hours necessary to actually perform the work; the PPE/Laundry Group to be used during the performance of the work; and the Total # of Jumps; e.g., 4/20/640 Group 1 160*

| Labor Type | Code | Persons/Days/Hours | PPE/Laundry Group | Total Jumps |
|---|---|---|---|---|
| Program Manager | HBA | | | |
| Manager/Senior Staff | HBB | | | |
| Technical Advisors | HBTA | 1 / 45 / 40 | | |
| Project Manager/HP Manager | HBPM | 2 / 45 / 80 | | |
| Task Leader | HBTL | 1 / 45 / 80 | | |
| Battelle Technician | HBT | 1 / 45 / 45 | | |
| Battelle Technician O/T | HBTO | | | |
| RAL Staff | HBL | | | |
| Support Professional | HBP | | | |
| Secretary/Clerical | HBS | | | |
| Decon Ops Hourly | HBH | | | |
| BCO Support | HBCO | | | |
| BCO Skilled Laborer | HCE | | | |
| BCO Skilled Laborer O/T | HCEO | | | |
| BCO Facility Manager | HCF | | | |
| | | | | |
| Bartlett Technician | HRD | | | |
| Bartlett Maint Specialist | HRDS | | | |
| Bartlett Health Physics | HRH | | | |
| Bartlett Admin Support | HRA | | | |
| | | | | |

**Subcontract/Purchased Service:** Demolition Contractor – per Loewendick estimate = $125,000 for above grade & slab removal, $15,000 for column footer removal to 6 ft below grade, $12,000 for fuel tank removal, and 37,013 for backfill and seed.

**Special Equipment/Material:** N/A

**Comments/Explanations:**

**Basis of Estimate:**

**What is the estimator's experience?** Twenty-five years of nuclear submarine operations and repair. Planning, nuclear quality assurance, and nuclear repair planning.

**What experience is directly related to BCLDP?** Nine years of training, and one and half years of project management in JN-3.

**Did we apply a complexity factor during our thought process?** No complexity factor applied to this estimate

**Completed by:** C.A. Brenner (updated by D Seifert) **Date:** 5/22/02 **Rev. No.:** 2

☐JN-1 ☒ JN-2 ☐ JN-3 ☐ Ext. Area ☐ Env. Monit. ☐ Sample Analysis ☐ Waste Mgmt

**Activity No.:** D074 **Work Pkg. No.:** 7D2-B05

**Function Name:** Survey and Monitor Underground Materials

**Component Name:** JN-2 Underground Materials

**Function Description:** Baseline Characterization and Final Status Surveys of JN-2 Underground Materials

## Basis of Estimate

**Strategy for Accomplishing Function:** Perform Baseline Characterization consistent with NUREG 5849

**Applicable Requirements/Procedures/Work Instructions:**

NUREG 5849 "Manual for Conducting Radiological Surveys in Support of License Termination"; Characterization & Final Status Survey Plan for the West Jefferson North Site March 2000; DD-93-04 & 05; DD-97-02; DD-CP-002, 004, & 030; HP-AP-1.0, 2.0, & 5.0; HS-AP-2.0, 4.0, & 5.0; HS-OP-001; PR-AP-17.1; QD-AP-4.1, 5.2, 6.1, 7.1; RL-AP-1.0; SIH-PP-08; TD-AP-2.0

**Input Descriptions:**

1. JN-2 footprint
2. Near Greenfield conditions exist
3. Approved Work Instruction
4. 400 ft underground drain trenches.

**Output Descriptions:**

1. Establish Underground Materials Radiological Background
2. Material Decision Level Values (DLVs) Determined
3. 72 soil samples to be submitted to laboratory for gamma spec for final status
4. Walkover data to report generation
5. Hotspot rate @ 5% : assumed 1 grid contaminated ( 8 confirmation samples needed)
6. 8 alpha isotopic
7. 133 gamma spec samples from drain trenches
8. 13 alpha spec samples from drain trenches

**Assumptions:**

Ground Material Background & DLVs :

1. 2 types of materials are present (1 concrete; 1 soil)
2. (40) 1 minute measurements for alpha + beta window per material
3. (40) 1 minute measurements for alpha window per material
4. (40) 2 minute measurements for soil DLV gamma measurements
5. 3 minute prep/setup/taking floor & soil readings (100%) = 4 hr
6. No significant down time; 1 d to perform DLVs
7.

Surveys:

1. 100% of all ground area will be surveyed. Assumes footprint only!
2. Building Footprint is 90' x 90' =8100 square feet = 752 square meters
3. 8 (10mx10m) grids
4. Walkover rate 200 square meters/d/tech
5. Sampling Rate 2 locations per hour
6. 4 locations/grid; 2 samples/location; 8 samples/grid
7. Sample @ surface & sample @ 1m @ each location
8. 5% of grids contaminated 1 additional grid assumed 4 locations
9. No deep core samples necessary.

10. All Utilities Identified
11. No significant down time
12. WI takes 16 hr to prepare/ Safety Prof 8hr for WI/SCL/ 8 hr Rad/ALARA review/ 4 hr WM/ 8hr for 2 MgrsRev./8 hrs comment resolve/ 8 hr data clerk; WI includes D075
13. Line Location 2 techs for 2 days/ 1 tech for 2 days to document/ Outside Vendor=48 hrs
    BCO Utilities 2 persons 2days to review and approve=32 hrs
14. Underground drain trenches will be sampled every 3 ft for gamma spec and every 30 ft for alpha spec.

Data Technician :

1. Technician inputs 3 data values for each grid in spreadsheet
2. Technician also performs QA/QC for the data input & data sheets
3. Technician identifies grid above release criteria & background
   - 8 - 10mx10m grids
   - walkover data
   - 72 samples from lab.

**Estimated Time to Plan the Work (Including Review and Approval):** 10 days ( 5d for WI/ 5d Line Loc)

**Estimated Resources Required to Plan the Work**

*In the following table, for each appropriate labor type enter the # of Persons involved in planning the activity, the # of Days (full or partial) they will be involved, and the total # of person-Hours necessary to plan the work, e.g., 2/5/36*

| Labor Type | Code | Persons/Days/Hours |
|---|---|---|
| Manager/Senior Staff | HBB | 3/4/32 |
| Technical Advisors | HBTA | 3/3/20 |
| Project Manager/HP Manager | HBPM | |
| Task Leader | HBTL | |
| Secretary/Clerical | HBS | 1/1/8 |
| Support Professional (Line Loc) | HBP | 4/5/80 |
| Bartlett Health Physics | HRH | |

**Estimated Time to Perform the Work:** 14 work days for survey/sampling

**Estimated Resources Required to Perform the Work**

*In the following table, for each appropriate labor type enter the # of Persons working on the activity, the # of Days (full or partial) they are involved, and the total # of Hours necessary to actually perform the work; the PPE/Laundry Group to be used during the performance of the work; and the Total # of Jumps; e.g., 4/20/640 Group 1 160*

| Labor Type | Code | Persons/Days/Hours | PPE/Laundry Group | Total Jumps |
|---|---|---|---|---|
| Program Manager | HBA | | | |
| Manager/Senior Staff | HBB | 1/14/28 | NA | NA |
| Technical Advisors (Safety) | HBTA | 1/14/14 | NA | NA |
| Project Manager/HP Manager | HBPM | | | |
| Task Leader | HBTL | 1/14/56 | 0 | 14 |
| Battelle Technician (HP) | HBT | 1/14/112 | 0 | 14 |
| Battelle Technician O/T | HBTO | | | |
| RAL Staff | HBL | | | |
| Support Professional | HBP | | | |
| Secretary/Clerical | HBS | | | |
| Decon Ops Hourly | HBH | | | |
| BCO Support | HBCO | | | |
| BCO Skilled Laborer | HCE | | | |
| BCO Skilled Laborer O/T | HCEO | | | |

| | | | | |
|---|---|---|---|---|
| BCO Facility Manager | HCF | | | |
| | | | | |
| Bartlett Technician | HRD | | | |
| Bartlett Maint Specialist | HRDS | | | |
| Bartlett Health Physics<br>(Instruments)<br>(Data) | HRH | 3/14/336<br>1/14/11<br>1/14/106 | 0<br>NA<br>NA | 39<br>NA<br>NA |
| Bartlett Admin Support | HRA | | | |

**Subcontract/Purchased Service:** Utilocate line location service crew of 2 for 40 hours = $4,018

**Special Equipment/Material:** Geoprobe & Tooling (captured under WP 783)

**Comments/Explanations:**
**Basis of Estimate**

**What is estimator's experience?**
15 years of health physics & radiological release management

**What experience is directly related to BCLDP?**
10 years of BCLDP characterization & radiological release program; 2 years at West Jefferson

**Was a complexity factor used?**
Work was similar to the clearance of KA grounds. A complexity factor such as a significant radioactive plume beneath the building was not used

**Completed by:** J.F. POLIZIANI **Date:** 5/07/01 **Rev No.:** 2

☐JN-1 ☒ JN-2 ☐ JN-3 ☐ Ext. Area ☐ Env. Monit. ☐ Sample Analysis ☐ Waste Mgmt

**Activity No.:** D075 **Work Pkg. No.:** 7D4-B16

**Function Name:** Perform JN-2 Underground Remediation Completion Survey

**Component Name:** JN-2 underground

**Function Description:** Perform Decon Completion Surveys & Sampling to Demonstrate Underground Materials satisfy release criteria.

## Basis of Estimate

**Strategy for Accomplishing Function:** Perform Decon Completion Walkover and Soil Sampling consistent with NUREG 5849

**Applicable Requirements/Procedures:**

NUREG 5849 " Manual for Conducting Radiological Surveys in Support of License Termination; Characterization & Final Status Plan for the West Jefferson North Site; DD-93-04; HS-AP-2.0, 4.0, &5.0; HS-OP-001; HP-AP-1.0, 2.0, & 5.0; MA-AP-20.1; PR-AP-17.1; RL-AP-1.0; QD-AP-5.2 & 6.1; SM-OP-001; TD-AP-2.0 & 3.0; WA-OP-020 & 036

**Input Descriptions:**

1. JN-2 Footprint; Low Radiation Background
2. Near Greenfield Conditions exist/Building demolished
3. Approved Work Instruction.

**Output Descriptions:**

1. 8 soil samples to be sent to RAL for gamma spec analysis
2. Walkover data for grid generated
3. Data to report generation
4. 1 alpha isotopic sample.

**Assumptions:**

1. Building Footprint is (8) 100 sq. m. grids; See assumptions D074
2. 1 grid is contaminated; 4 locations; 8 samples
3. Walkover rate is 200 sq. m. per tech.
4. Soil sample rate is 2 locations per hr
5. No deep cores necessary
6. No significant down time
7. WI under D074
8. Utilities/Lines Identified under D074

**Estimated Time to Plan the Work (Including Review and Approval):** 0 days; WI under D074

### Estimated Resources Required to Plan the Work

*In the following table, for each appropriate labor type enter the # of Persons involved in planning the activity, the # of Days (full or partial) they will be involved, and the total # of person-Hours necessary to plan the work, e.g., 2/5/36*

| Labor Type | Code | Persons/Days/Hours |
|---|---|---|
| Manager/Senior Staff | HBB | NA |
| Technical Advisors | HBTA | NA |
| Project Manager/HP Manager | HBPM | NA |
| Task Leader | HBTL | NA |
| Secretary/Clerical | HBS | NA |
| Support Professional | HBP | NA |
| Bartlett Health Physics | HRH | NA |
| | | |
| | | |

**Estimated Time to Perform the Work:** 1 day to survey & sample

**Estimated Resources Required to Perform the Work**

*In the following table, for each appropriate labor type enter the # of Persons working on the activity, the # of Days (full or partial) they are involved, and the total # of Hours necessary to actually perform the work; the PPE/Laundry Group to be used during the performance of the work; and the Total # of Jumps; e.g., 4/20/640 Group 1 160*

| Labor Type | Code | Persons/Days/Hours | PPE/Laundry Group | Total Jumps |
|---|---|---|---|---|
| Program Manager | HBA | | | |
| Manager/Senior Staff | HBB | 1/1/2 | NA | NA |
| Technical Advisors | HBTA | 1/1/1 | NA | NA |
| Project Manager/HP Manager | HBPM | | | |
| Task Leader | HBTL | 1/1/4 | 0 | 1 |
| Battelle Technician (HP) | HBT | 1/1/8 | 0 | 1 |
| Battelle Technician O/T | HBTO | | | |
| RAL Staff | HBL | | | |
| Support Professional | HBP | | | |
| Secretary/Clerical | HBS | | | |
| Decon Ops Hourly | HBH | | | |
| BCO Support | HBCO | | | |
| BCO Skilled Laborer | HCE | | | |
| BCO Skilled Laborer O/T | HCEO | | | |
| BCO Facility Manager | HCF | | | |
| | | | | |
| Bartlett Technician | HRD | | | |
| Bartlett Maint Specialist | HRDS | | | |
| Bartlett Health Physics<br>(Instruments)<br>(Data) | HRH | 3/1/24<br>1/1/1<br>1/1/8 | 0<br>NA<br>NA | 3<br>NA<br>NA |
| Bartlett Admin Support | HRA | | | |
| | | | | |

**Subcontract/Purchased Service:** None Identified

**Special Equipment/Material:** Geoprobe & Tooling (captured under WP 783)

**Comments/Explanations:** None

**Basis of Estimate**

**What is the estimator's experience?**
15 years of health physics & radiological release program management

**What experience is directly related to the BCLDP?**
10 years of BCLDP characterization & radiological release program management

**Was a complexity factor used?**
No, work similar to KA

**Completed by:** J.F. POLIZIANI **Date:** 5/31/01 **Rev. No.:** 2

☐JN-1 ☒ JN-2 ☐ JN-3 ☐ Ext. Area ☐ Env. Monit. ☐ Sample Analysis ☐ Waste Mgmt

**Activity No.:** D080 **Work Pkg. No.:** 7D4-B15

**Function Name:** Excavate underground

**Component Name:** JN-2 Footprint

**Function Description:** Excavate contaminated soil from below building footprint.

## Basis of Estimate

**Strategy for Accomplishing Function:** Engage trained excavation contractor to excavate contaminated soil into bags for disposal at approved site. Soil is screened for activity during excavation and delivered to waste management.

**Applicable Requirements/Procedures/Work Instructions:**

DD-93-04; HS-AP-2.0, 4.0, & 5.0; HS-OP-001; HP-AP-1.0, 2.0, & 5.0; MA-AP-20.1; PR-AP-17.1; RL-AP-1.0 QD-AP-5.2 & 6.1; SM-OP-001; TD-AP-2.0 & 3.0; WA-OP-020 & 036

**Input Descriptions:**

1. 754 cu ft of contaminated soil within JN-2 footprint.

**Output Descriptions:**

1. Contaminated soil containerized in 28 one cu yd bags for shipping off site.
2. Characterization completion survey data.
3. 56 Marinelli soil samples for analysis.
4. Job control waste 54 cu ft

**Assumptions:**

1. Production rate is 8 bags per day using 1.5 cu ft excavator allowing for field screening and sampling.
2. Approximately 5% of the soil area under the building is contaminated to a depth of 2 ft.

**Estimated Time to Plan the Work (Including Review and Approval):** 10 days

### Estimated Resources Required to Plan the Work

*In the following table, for each appropriate labor type enter the # of Persons involved in planning the activity, the # of Days (full or partial) they will be involved, and the total # of person-Hours necessary to plan the work, e.g., 2/5/36*

| Labor Type | Code | Persons/Days/Hours |
|---|---|---|
| Manager/Senior Staff | HBB | |
| Technical Advisors | HBTA | 1 / 10 / 10 |
| Project Manager/HP Manager | HBPM | 2 / 10 / 40 |
| Task Leader | HBTL | 1 / 10 / 20 |
| Secretary/Clerical | HBS | 1 / 10 / 10 |
| Support Professional | HBP | |
| Bartlett Health Physics | HRH | 1 / 5 / 5 |
| | | |
| | | |

**Estimated Time to Perform the Work:** 8 days

**Estimated Resources Required to Perform the Work**

*In the following table, for each appropriate labor type enter the # of Persons working on the activity, the # of Days (full or partial) they are involved, and the total # of Hours necessary to actually perform the work; the PPE/Laundry Group to be used during the performance of the work; and the Total # of Jumps; e.g., 4/20/640 Group 1 160*

| Labor Type | Code | Persons/Days/Hours | PPE/Laundry Group | Total Jumps |
|---|---|---|---|---|
| Program Manager | HBA | | | |
| Manager/Senior Staff | HBB | | | |
| Technical Advisors | HBTA | 1 / 8 / 8 | | |
| Project Manager/HP Manager | HBPM | 2 / 8 / 16 | | |
| Task Leader | HBTL | 1 / 8 / 64 | Group 0 | 8 |
| Battelle Technician | HBT | | | |
| Battelle Technician O/T | HBTO | | | |
| RAL Staff | HBL | | | |
| Support Professional | HBP | 1 / 1 / 4 | | |
| Secretary/Clerical | HBS | | | |
| Decon Ops Hourly | HBH | | | |
| BCO Support | HBCO | | | |
| BCO Skilled Laborer | HCE | | | |
| BCO Skilled Laborer O/T | HCEO | | | |
| BCO Facility Manager | HCF | | | |
| | | | | |
| Bartlett Technician | HRD | 2 / 8 / 128 | Group 1 | 32 |
| Bartlett Maint Specialist | HRDS | | | |
| Bartlett Health Physics | HRH | 3 / 8 / 128 | Group 1 | 32 |
| Bartlett Admin Support | HRA | | | |
| | | | | |

**Subcontract/Purchased Service:** Excavation contractor for 5 days = $1904 + TB007 excavator for 5 days = $823.

**Special Equipment/Material:**

**Comments/Explanations:**

**Basis of Estimate:**

Activity Number: D080

**What is the estimator's experience?** Twenty-five years of nuclear submarine operations and repair. Planning, nuclear quality assurance, and nuclear repair planning.

**What experience is directly related to BCLDP?** Nine years of training, and one and half years of project management in JN-3.

**Did we apply a complexity factor during our thought process?** No complexity factor applied to this estimate

**Completed by:** C.A. Brenner/D. Seifert **Date:** 5/2/02 **Rev. No.**: 2

☐JN-1 ☒ JN-2 ☐ JN-3 ☐ Ext. Area ☐ Env. Monit. ☐ Sample Analysis ☐ Waste Mgmt

**Activity No.:** D081 **Work Pkg. No.:** 7D4-B17

**Function Name:** Perform JN-2 Final Status Survey Before Demolition

**Component Name:** JN-2 Building

**Function Description:** Final Status Survey of JN-2

## Basis of Estimate

**Strategy for Accomplishing Function:** Perform Final Status Survey consistent with NUREG 5849

**Applicable Requirements/Procedures/Work Instructions:**

NUREG 5849 "Manual for Conducting Radiological Surveys in Support of License Termination"; Characterization & Final Status Plan for the West Jefferson North Site; DD-CP-002, 004, 010, & 030; DD-93-04; DD-97-02; HS-AP-4.0 & 5.0; HS-OP-001; PR-AP-17.1; QD-AP-5.2 & 6.1; TD-AP-2.0

**Input Descriptions:**

1. Rooms and Areas that have undergone material removal, M&E removal, and characterization & decon.
2. Approved Work Instruction.

**Output Descriptions:**

1. Data to report generation
2. 600 grids (50%) of total will be scanned producing 3 data values per grid
3. 600 final status

**Assumptions:**

1. 5% of all monitored areas were contaminated
2. Time for Interim Decon Effectiveness Surveys are part of the Decontamination Crew
3. 100% of all floor area were surveyed.
4. 100% of all wall area up to 2m were surveyed.
5. 120% of all ceilings were surveyed ( 20% added for horizontal surfaces)
6. 10%or 30sq. meters whichever is larger of wall areas greater than 2m were monitored
7. Normal rate for characterization surveys is 6 square meters per technician-hour
8. Ladder rate for characterization surveys is 5 square meters per technician-hour
9. Lift rate for characterization surveys is 4 square meters per technician-hour
10. Drain Samples 2/hr; 16 samples total
11. The rate for characterization surveys includes : 5cm/sec survey rate, documentation, assess elevated levels>DLV , alpha, alpha + beta 2min counts required, perform smears.
12. Room & Area Volumes were taken from the REV3 Baseline waste volume inventory.
13. Instrument Tech @ 10% Repair & Cal.
14. 5% of grids contaminated; 40% grids are adjacent; 55% of grids are unaffected and scanned @ 10%
15. 50% of grids rescanned for final status survey
16. Characteriztion of Building takes 34d ...Final Status estimated at 17d

**Estimated Time to Plan the Work (Including Review and Approval):** 0 days; WI under D006

### Estimated Resources Required to Plan the Work

*In the following table, for each appropriate labor type enter the # of Persons involved in planning the activity, the # of Days (full or partial) they will be involved, and the total # of person-Hours necessary to plan the work, e.g., 2/5/36*

| Labor Type | Code | Persons/Days/Hours |
|---|---|---|
| Manager/Senior Staff | HBB | NA |
| Technical Advisors | HBTA | NA |
| Project Manager/HP Manager | HBPM | NA |
| Task Leader | HBTL | NA |
| Secretary/Clerical | HBS | NA |
| Support Professional | HBP | NA |
| Bartlett Health Physics | HRH | NA |

**Estimated Time to Perform the Work:** 17 work day for decon survey

### Estimated Resources Required to Perform the Work

*In the following table, for each appropriate labor type enter the # of Persons working on the activity, the # of Days (full or partial) they are involved, and the total # of Hours necessary to actually perform the work; the PPE/Laundry Group to be used during the performance of the work; and the Total # of Jumps; e.g., 4/20/640 Group 1 160*

| Labor Type | Code | Persons/Days/Hours | PPE/Laundry Group | Total Jumps |
|---|---|---|---|---|
| Program Manager | HBA | | NA | NA |
| Manager / Senior Staff | HBB | 1/17/34 | | |
| Technical Advisors (Safety) | HBTA | 1/17/17 | NA | NA |
| Project Manager / HP Manager | HBPM | | | |
| Task LeaderSafety Prof. | HBTL | 1/17/68 | 0 | 17 |
| Battelle Technician (HP) | HBT | 1/17/136 | 0 | 17 |
| Battelle Technician O/T | HBTO | | | |
| RAL Staff | HBL | | | |
| Support Professional | HBP | | | |
| Secretary / Clerical | HBS | | | |
| Decon Ops Hourly | HBH | | | |
| BCO Support | HBCO | | | |
| BCO Skilled Laborer | HCE | | | |
| BCO Skilled Laborer O/T | HCEO | | | |
| BCO Facility Manager | HCF | | | |
| | | | | |
| Bartlett Technician | HRD | | | |
| Bartlett Maint Specialist | HRDS | | | |
| Bartlett Health Physics<br>(Instrument)<br>(Data) | HRH | 3/17/408<br>1/17/17<br>1/17/136 | 0<br>NA<br>NA | 102<br>NA<br>NA |
| Bartlett Admin Support | HRA | | | |

**Subcontract/Purchased Service:** None identified

**Special Equipment/Material:** 17 day of 80 foot aerial lift = $4,230; necessary for survey of building exterior, high bay, walls > 12 ft

**Comments/Explanations:**

**Basis of Estimate**

**What is the estimator's experience?**
15 years of health physics and radiological release program management

**What experience is directly related to BCLDP?**
10 years of BCLDP characterization & radiologicalrelease program experience; 2 years at West Jefferson

**Was a complexity factor used?**
Work is similar to KA-2 & KA-3, no complexity factor used

**Completed by:** J.F. POLIZIANI **Date:** 05/08/00 **Rev. No.:** 2

☐ JN-1 ☐ JN-2 ☐ JN-3 ☐ Ext. Area ☐ Env. Mtr. ☐ Samples ☐ TRU/Waste ☒ Release Site

**Activity No.:** D082 **Work Pkg. No.:** 7D5-B02

**Function Name:** Conduct IVC for JN-2

**Component Name:** IVC for JN-2

**Function Description:** Support & have an Independent Verification Contractor (IVC) perform verification surveys & sampling consistent with the requirements of NUREG 5849.

## Basis of Estimate

**Strategy for Accomplishing Function:** JN-2 Areas (IVC) will be subjected to the release process defined in NUREG 5849 "Manual for Conducting Radiological Surveys in Support of License Termination" Part of the process is to perform an IVC type survey to ensure release criteria have been satisfied.

**Applicable Requirements/Procedures:**

NUREG 5849 " Manual for Conducting Radiological Surveys in Support of License Termination"; Characterization and Final Status Plan for West Jefferson North Site (DD-97-02), March 2000; HS-AP-5.0; HS-OP-001.

**Input Descriptions:**

1. Areas to be IVC surveyed are remediated & a BCLDP final status survey performed.
2. BCLDP Characterization & Final Status Report for Building JN2

**Output Descriptions**:

1. IVC Survey Plan
2. IVC survey results & soil samples
3. IVC Survey Report

**Assumptions**:

1. Onsite survey & sampling takes IVC 5 days (1 day travel)
2. One HBTA to assist full time
3. 2 Bartlett HP tech to assist full time
4. Additional Significant Remediation not needed.
5. Spot decon @ 3 techs for 1 day
6. 6. Decision to proceed with clean demolition of building based on informal verbal decision by IVC, formal report to follow.

**Estimated Time to Plan the Work (Including Review and Approval):** 30 d

### Estimated Resources Required to Plan the Work

*In the following table, for each appropriate labor type enter the # of Persons involved in planning the activity, the # of Days (full or partial) they will be involved, and the total # of person-Hours necessary to plan the work, e.g., 2/5/36*

| Labor Type | Code | Persons/Days/Hours |
|---|---|---|
| Manager/Senior Staff | HBB | 1/30/20 |
| Technical Advisors | HBTA | NA |
| Project Manager/HP Manager | HBPM | NA |
| Task Leader | HBTL | NA |
| Secretary/Clerical | HBS | NA |
| Support Professional | HBP | NA |
| Bartlett Health Physics | HRH | NA |
| | | |
| | | |

**Estimated Time to Perform the Work:** 15 Total Days ;5 d onsite/travel; 10d lab analysis and informal decision

## Estimated Resources Required to Perform the Work

*In the following table, for each appropriate labor type enter the # of Persons working on the activity, the # of Days (full or partial) they are involved, and the total # of Hours necessary to actually perform the work; the PPE/Laundry Group to be used during the performance of the work; and the Total # of Jumps; e.g., 4/20/640* *Group 1* *160*

| Labor Type | Code | Persons/Days/Hours | PPE/Laundry Group | Total Jumps |
|---|---|---|---|---|
| Program Manager | HBA | | | |
| Manager/Senior Staff | HBB | 1/5/40 | NA | NA |
| Technical Advisors—Safety<br>Technical Advisor ---Char | HBTA | 1/5/5 | NA<br>0 | NA<br>5 |
| Project Manager/HP Manager | HBPM | | | |
| Task Leader-Decon | HBTL | 1/5/40 | | 5 |
| Battelle Technician (HP) | HBT | | 0 | 0 |
| Battelle Technician O/T | HBTO | | | |
| RAL Staff | HBL | | | |
| Support Professional | HBP | | | |
| Secretary/Clerical | HBS | | | |
| Decon Ops Hourly | HBH | | | |
| BCO Support | HBCO | | | |
| BCO Skilled Laborer | HCE | | | |
| BCO Skilled Laborer O/T | HCEO | | | |
| BCO Facility Manager | HCF | | | |
| | | | | |
| Bartlett Technician-Decon | HRD | 2/1/16 | 0 | 4 |
| Bartlett Maint Specialist | HRDS | | | |
| Bartlett Health Physics<br>Bartlett Health Physics (full) | HRH | <br>2/5/80 | 0<br>0 | <br>10 |
| Bartlett Admin Support | HRA | | | |
| | | | | |

**Subcontract/Purchased Service:** IVC Services for $50,000

**Special Equipment/Material:** 80 ft aerial lift for 5 d = $1,428

**Comments/Explanations:** Estimate to be verified w/IVC

**Basis of Estimate**

**What is the estimator's experience?**
15 years of health physics & radiological release program management

**What experience is directly related to the BCLDP?**
10 years of BCLDP characterization & radiological release program experience; 2 years at West Jefferson

**Was a complexity factor used?**
No, work similar to KA

**Completed by:** J.F. POLIZIANI **Date:** 5/30/2001 **Rev. No.:** 2

☐ JN-1 ☐ JN-2 ☐ JN-3 ☐ Ext. Area ☐ Env. Mtr. ☐ Samples ☐ TRU/Waste ☒ Release Site

**Activity No.:** DS010 **Work Pkg. No.:** 7D5-B01

**Function Name:** Prepare JN-2 Areas Characterization and Final Status Report

**Component Name:** JN-2 Areas

**Function Description:** Produce the Characterization & Final Status Report for the JN-2 Areas

## Basis of Estimate

**Strategy for Accomplishing Function:** Perform Baseline Characterization and Final Status Surveys consistent with NUREG 5849

**Applicable Requirements/Procedures:**

NUREG 5849 "Manual for Conducting Radiological Surveys in Support of License Termination"; Characterization & Final Status Survey Plan for the West Jefferson North Site March 2000; BCLDP Procedures DD-CP-002, 004; DD-93-04; PR-AP-17.1; TD-AP-2.0.

**Input Descriptions:**

1. Completed Data Sheets form Characterization & Final Status Field Work

**Output Descriptions:**

1. Characterization & Final Status Report for the JN-2 Area

**Assumptions:**

1. Data Reduction & Report Generation will take 20 working-d post field activities
2. Review & Comment Resolution will take 15 working-d in schedule
3. Report Schedule will take 40 working-d total.
4. Map production will take 10d of labor
5. 6 professionals will take 8 hrs each to review/comment/resolve comments
6. 5 d of technician time is necessary to resolve/incorporate comments
7. Room & Area Volumes were taken from the REV3 Baseline waste volume inventory.
8. IVC/NRC approval necessary for Area Report
9. Only one Area Report will be produced.

**Estimated Time to Plan the Work (Including Review and Approval):** 0 days

### Estimated Resources Required to Plan the Work

*In the following table, for each appropriate labor type enter the # of Persons involved in planning the activity, the # of Days (full or partial) they will be involved, and the total # of person-Hours necessary to plan the work, e.g., 2/5/36*

| Labor Type | Code | Persons/Days/Hours |
|---|---|---|
| Manager/Senior Staff | HBB | NA |
| Technical Advisors | HBTA | NA |
| Project Manager/HP Manager | HBPM | NA |
| Task Leader | HBTL | NA |
| Secretary/Clerical | HBS | NA |
| Support Professional | HBP | NA |
| Bartlett Health Physics | HRH | NA |
| | | |
| | | |

**Estimated Time to Perform the Work:** 40 working days

**Estimated Resources Required to Perform the Work**

*In the following table, for each appropriate labor type enter the # of Persons working on the activity, the # of Days (full or partial) they are involved, and the total # of Hours necessary to actually perform the work; the PPE/Laundry Group to be used during the performance of the work; and the Total # of Jumps; e.g., 4/20/640 Group 1 160*

| Labor Type | Code | Persons/Days/Hours | PPE/Laundry Group | Total Jumps |
|---|---|---|---|---|
| Program Manager | HBA | | | |
| Manager/Senior Staff | HBB | 1/40/200 | NA | NA |
| Technical Advisors | HBTA | 6/1/48 | NA | NA |
| Project Manager/HP Manager | HBPM | | | |
| Task Leader | HBTL | | | |
| Battelle Technician | HBT | | | |
| Battelle Technician O/T | HBTO | | | |
| RAL Staff | HBL | | | |
| Support Professional | HBP | | | |
| Secretary/Clerical | HBS | | | |
| Decon Ops Hourly | HBH | | | |
| BCO Support | HBCO | | | |
| BCO Skilled Laborer | HCE | | | |
| BCO Skilled Laborer O/T | HCEO | | | |
| BCO Facility Manager | HCF | | | |
| | | | | |
| Bartlett Technician | HRD | | | |
| Bartlett Maint Specialist | HRDS | | | |
| Bartlett Health Physics –Maps<br>Data | HRH | 1/10/80<br>1/25/200 | NA<br>NA | NA<br>NA |
| Bartlett Admin Support | HRA | | | |
| | | | | |

**Subcontract/Purchased Service:** CAD Map Generation Services, 80 hrs = $3,384

**Special Equipment/Material:** None Identified

**Comments/Explanations:** None

**Basis of Estimate**

**What is the estimator's experience?**
15 years of health physics & radiological release program management

**What experience is directly related to the BCLDP?**
10 years of BCLDP characterization & radiological release program experience; 2 years at West Jefferson

**Was a complexity factor used?**
No, work similar to KA

**Completed by:** J. F. Poliziani **Date:** 5/30/01 **Rev. No.:** 2

☐ JN-1 ☐ JN-2 ☐ JN-3 ☐ Ext. Area ☐ Env. Mtr. ☐ Samples ☐ TRU/Waste ☒ Release Site

**Activity No.:** DS011 **Work Pkg. No.:** 7D5-B01

**Function Name:** Conduct JN-2 Areas IVC

**Component Name:** JN-2 Areas

**Function Description:** Support & have an Independent Verification Contractor (IVC) perform verification surveys & sampling consistent with the requirements of NUREG 5849.

## Basis of Estimate

**Strategy for Accomplishing Function:** JN-2 Areas will be subjected to the release process defined in NUREG 5849 "Manual for Conducting Radiological Surveys in Support of License Termination" Part of the process is to perform an IVC type survey to confirm release criteria have been satisfied.

**Applicable Requirements/Procedures:**

NUREG 5849 " Manual for Conducting Radiological Surveys in Support of License Termination"; Characterization and Final Status Plan for West Jefferson North Site (DD-97-02), March 2000; HS-AP-5.0; HS-OP-001.

**Input Descriptions:**

1. Areas to be IVC surveyed are remediated & a BCLDP final status survey performed.
2. BCLDP Characterization & Final Status Report for JN-2 Area

**Output Descriptions**:

1. IVC Survey Plan
2. IVC survey results & soil samples
3. IVC Survey Report

**Assumptions**:

1. Onsite survey & sampling takes IVC 4 days (1 day travel)
2. One HBTA to assist full time
3. One Bartlett HP tech to assist full time
4. Geoprobe Crew to sample for 2 days
5. No significant additional decon necessary
6. Crew of 3 techs for 1 day spot decon

**Estimated Time to Plan the Work (Including Review and Approval):** 30 d

### Estimated Resources Required to Plan the Work

*In the following table, for each appropriate labor type enter the # of Persons involved in planning the activity, the # of Days (full or partial) they will be involved, and the total # of person-Hours necessary to plan the work, e.g., 2/5/36*

| Labor Type | Code | Persons/Days/Hours |
|---|---|---|
| Manager/Senior Staff | HBB | 1/30/20 |
| Technical Advisors | HBTA | NA |
| Project Manager/HP Manager | HBPM | NA |
| Task Leader | HBTL | NA |
| Secretary/Clerical | HBS | NA |
| Support Professional | HBP | NA |
| Bartlett Health Physics | HRH | NA |
| | | |
| | | |

**Estimated Time to Perform the Work:** 64 Total Days ;4 d onsite/travel; 30d lab analysis; 30d report generation

**Estimated Resources Required to Perform the Work**

*In the following table, for each appropriate labor type enter the # of Persons working on the activity, the # of Days (full or partial) they are involved, and the total # of Hours necessary to actually perform the work; the PPE/Laundry Group to be used during the performance of the work; and the Total # of Jumps; e.g., 4/20/640 Group 1 160*

| Labor Type | Code | Persons/Days/Hours | PPE/Laundry Group | Total Jumps |
|---|---|---|---|---|
| Program Manager | HBA | | | |
| Manager/Senior Staff | HBB | 1/4/14 | NA | NA |
| Technical Advisors—Safety<br>Technical Advisor ---Char | HBTA | 1/3/3<br>1/3/24 | NA<br>0 | NA<br>3 |
| Project Manager/HP Manager | HBPM | | | |
| Task Leader | HBTL | 1/1/8 | 0 | 2 |
| Battelle Technician (HP) | HBT | 1/3/24 | 0 | 3 |
| Battelle Technician O/T | HBTO | | | |
| RAL Staff | HBL | | | |
| Support Professional | HBP | | | |
| Secretary/Clerical | HBS | | | |
| Decon Ops Hourly | HBH | | | |
| BCO Support | HBCO | | | |
| BCO Skilled Laborer | HCE | | | |
| BCO Skilled Laborer O/T | HCEO | | | |
| BCO Facility Manager | HCF | | | |
| | | | | |
| Bartlett Technician | HRD | 2/1/16 | 0 | 4 |
| Bartlett Maint Specialist | HRDS | | | |
| Bartlett Health Physics<br>Bartlett Health Physics (full) | HRH | 3/2/48<br>1/3/24 | 0<br>0 | 12<br>6 |
| Bartlett Admin Support | HRA | | | |
| | | | | |

**Subcontract/Purchased Service:** IVC Services for $35,000

**Special Equipment/Material:** None Identified

**Comments/Explanations:** Estimate to be verified w/IVC

**Basis of Estimate**

**What is the estimator's experience?**
15 years health physics & radiological program release management

**What experience is directly related to the BCLDP?**
10 years of BCLDP characterization & radiological release program experience; 2 years at West Jefferson

**Was a complexity factor used?**
No, work similar to KA

**Completed by:** J.F. POLIZIANI **Date:** 5/30/2001 **Rev. No.:** 2